

**Swallow Falls Bridge Replacement**  
**Youghiogheny River Scenic and Wild Rivers Application**  
**Environmental Assessment**  
**Garrett County, MD**



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## 1.0 PROJECT DESCRIPTION

### 1.1 INTRODUCTION

Garrett County (the County), in cooperation with the Maryland Department of Transportation - State Highway Administration (MDOT SHA), is proposing to replace Bridge No. G-0020, using a combination of local and federal funds. The project is located on Swallow Falls Road over the Youghiogheny River in Garrett County, Maryland, as shown on the project location map in Section 1.2.

Swallow Falls Road is a two lane, undivided open section, normal crowned roadway with a posted speed of 25 mph within the project area. The roadway is described as a local collector. The average daily traffic (ADT), based on information obtained from the bridge inspection report, is 400 vehicles/day (2001) to 465 vehicles/day (2035) with a 5% truck volume. The road is a County maintained roadway that runs in an east-west direction connecting Herrington Manor Road to Oakland Sang Run Road. The roadway consists of a 24-foot (+/-) paved width, allowing for two (2), 10-foot lanes with 2-foot (+/-) shoulders.

The existing bridge is a two (2) span simply supported steel beam bridge with an overall length of 101'-4" (+/-). The substructure consists of concrete crib wall abutments and a concrete pier. The clear roadway width of the bridge is 20'-0" (+/-). The existing bridge has been closed to traffic but remains in place. A temporary single lane, single span Acrow panel truss structure has been installed spanning above the deck of the existing 2-span bridge. The temporary truss span length is 149'-6" (+/-), center to center of bearings and is supported on temporary concrete stub abutments placed behind the crib wall abutments of the 2-span bridge. The temporary single lane bridge has a clear roadway width of 12'-6" (+/-).

The new proposed bridge is assumed to have an overall length of 120'-0" ( $\pm$ ) center to center of bearings. It will be designed to accommodate two (2) 5'-0" bicycle-compatible shoulders and a single 5'-0" sidewalk for pedestrian access on the north side of the bridge. The two (2) travel lanes will maintain the 10'-0" width of the approach roadway.

The Youghiogheny River has been assigned Use III-P surface water by the Maryland Department of the Environment (MDE). The river was designated by Maryland Department of Natural Resources (DNR) as a wild and scenic river in accordance with the Scenic and Wild Rivers Act. As described in COMAR 08.15.01.03, the designated wild river is the segment of the Youghiogheny River between Miller's Run, Maryland and the southern corporate limits of Friendsville, Maryland. The scenic corridor of the river includes the wild river and its bottom and the adjacent lands which are visible from the river. The project area is located within Swallow Falls State Park and contains high-quality, sensitive environmental resources.

This environmental assessment was completed using data collected during field delineations in conjunction with information outlined in the study and management plan developed for the Youghiogheny (LAB 1996). Original field delineations of wetlands, streams, forest stands, and specimen trees were performed in 2017. Additional field delineations were performed in 2020 to further refine the original findings and to expand the survey area. Using the data collected during the 2020 field work, a Natural Resource Inventory and Forest Stand Delineation (NRI/FSD) was submitted to the Maryland Department of Natural Resources

(DNR), in accordance with the Forest Conservation Act. The project received NRI/FSD approval in 2021, satisfying one component of the forestry laws applicable to this project.

The project will be required to consider several forestry laws to ensure environmental compliance:

1. *Roadside Tree Law*: Any tree that originates within a public road right-of-way is considered a roadside tree under the Maryland Roadside Tree Care Law (Nat. Res. Art. 5-406) and Regulations (COMAR 08.07.02) and any plans to remove, trim, or plant trees within the public right-of-way are required to obtain a Roadside Tree Permit from the Maryland Department of Natural Resources Forest Service.
2. *Forest Conservation Act*: The Forest Conservation Act requires that any project, on areas 40,000 square feet or greater, that is applying for a grading or sediment control permit shall have an approved Forest Conservation Plan and Forest Stand Delineation (Nat. Res. Art. 5-1601-5-16122, Annotated Code of Maryland). Projects proposed by a state or federal agency on state or federal land need to be submitted to the Maryland Department of Natural Resources Forest Service for review. Projects proposed for private land should be submitted to the local planning and zoning authority for review.
3. *Reforestation Law*: All highway construction projects utilizing \$1 or more of State funding must do mitigation related to forest impacts. The purpose of the Maryland Reforestation Law is to minimize forest disturbance during highway construction activities.

This report outlines existing conditions of the area, and potential adverse impacts associated with the project. It also discusses the various design alternatives that have been evaluated to best achieve the goals of the project.

### 1.2 PROJECT LOCATION

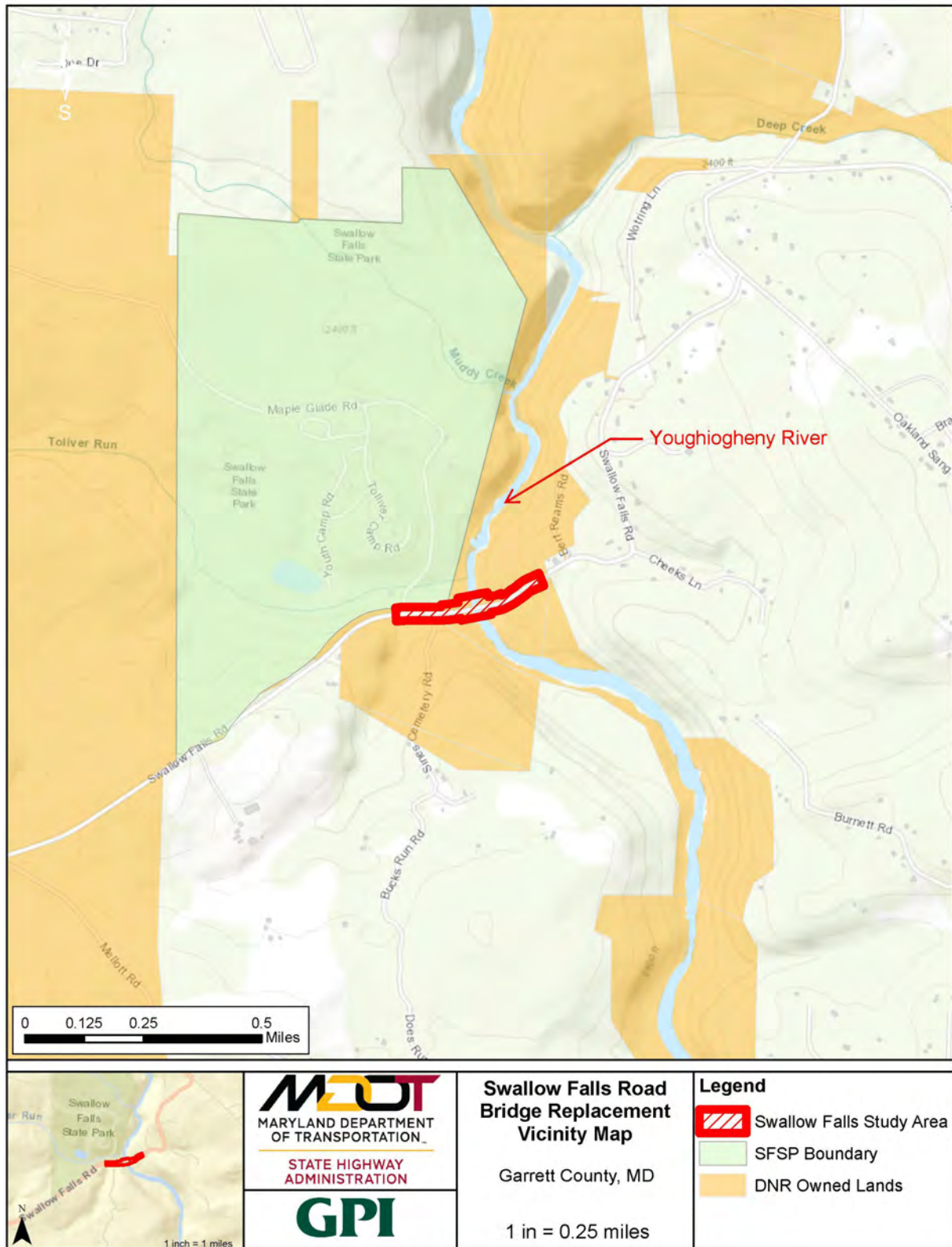


Figure 1 - Project Location Map



### 1.3 PROJECT SITE PHOTOGRAPHS

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**Image 1 – Upstream view of Youghiogheny River taken from the bridge on Swallow Falls Road.**



**Image 2 – Downstream view of Youghiogheny River taken from the bridge on Swallow Falls Road.**



**Image 3 – Downstream view of Youghiogheny River taken from the western bank, north of Swallow Falls Road.**



**Image 4 – Upstream view of Youghiogheny River taken from the western bank, north of Swallow Falls Road. The bridge to be replaced (Bridge No. G-0020) spanning the river is also shown.**



**Image 5 – Upstream view of the Youghiogheny River taken from the eastern bank, south of Swallow Falls Road.**



**Image 6 – Downstream view of the Youghiogheny River taken from the eastern bank, north of Swallow Falls Road.**



**Image 7 - View of the bridge approach on Swallow Falls Road, east of the bridge.**



**Image 8 - View of the bridge approach on Swallow Falls Road, west of the bridge.**



**Image 9 – View of the Swallow Falls Road Bridge from the eastern bank of Youghiogheny River, north of Swallow Falls Road. Visible are the abandoned stone abutment (left), the existing in-river center pier, and concrete abutment of the bridge (right).**

## **1.4 PROJECT PERMIT REQUIREMENTS**

The project is located within Swallow Falls State Park and will impact natural resources within the area. In order to maintain regulatory compliance, several permit approvals are required:

- NEPA Documentation
  - MHT Coordination
    - Responses received February 8, 2018
    - Phase I Archeology Assessment completed October 18, 2018
  - Trilogy Letter Coordination
    - DNR Wildlife Heritage Response May 7, 2019
    - USFW Response December 21, 2018
    - DNR Environmental Review Response May 16, 2018
  - Scenic and Wild Rivers Coordination
  - Programmatic Section 4(f) Evaluation
  - Categorical Exclusion Evaluation
  - Environmental Justice Evaluation
- MDE Joint Permit Application

## **1.5 COMPLIANCE HISTORY**

The applicant has never been cited for being out of compliance with the Scenic and Wild Rivers Act.

## 2.0 ENVIRONMENTAL ASSESSMENT

### 2.1 AQUATIC RESOURCES OF THE RIVER

#### EXISTING CONDITIONS

The Youghiogheny region contains a dense network of tributaries that provide habitat and resources for various wildlife throughout the area (LAB, 1996).

#### POTENTIAL ADVERSE IMPACTS

All of the design alternatives described in Section 3.2 include clearing of vegetation, grading of areas along the proposed roadway alignment, and in-stream work that will impose natural resource impacts. In-stream work associated with all of the proposed design alternatives includes the removal of the existing in-river center pier and the removal of the existing abutments on the riverbanks. Removal of these structures will have a lasting positive effect on the area by returning the river and its banks to original conditions that existed prior to the construction of the road or bridge. Construction impacts required to facilitate the proposed in-stream work will be temporary in nature consisting of maintenance of stream flow operations that will be utilized to create suitable conditions where the existing structures can be safely removed. Once the necessary work is complete, all methods used to divert the river will be removed with no permanent adverse impact to the area.

Impacts are quantified in Section 3.3 and are dependent on the specific design alternative that will be utilized.

### 2.2 RIVERINE RESOURCES OF THE RIVER

#### EXISTING CONDITIONS

The Youghiogheny region provides habitat and resources for a variety of wildlife, as well as provides recreational opportunities such as boating and fishing. The Deep Creek hydroelectric station located within the region provides electricity and allows for lake level management, fishery support, and white-water recreation (LAB, 1996).

#### POTENTIAL ADVERSE IMPACTS

As discussed in Section 2.1, any impacts to the river from construction will be considered temporary, having no lasting negative impact on the river. The work proposed within the stream will serve to improve riverine resources provided by the Youghiogheny. Removing the existing in-river pier and the existing abutments removes unnatural obstacles from the river and its banks, providing an improved recreational experience for activities such as fishing and kayaking.

New bridge abutments will be constructed outside of the river within the wild and scenic corridor. Grading and clearing required for installation of these structures will alter the appearance of the corridor within the project area, which will be visible from the Youghiogheny River.

## 2.3 ECOLOGICAL SYSTEMS

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### EXISTING CONDITIONS

Significant ecological systems within the region include wetland areas, streams, forest habitat and specimen trees, endangered and threatened species habitats, and scenic features. There is a predominance of ecologically significant and sensitive natural areas around Swallow Falls from Gap Run to Laurel Run. These areas of the river are extremely vulnerable to changes caused by development or extensive use (LAB, 1996).

### POTENTIAL ADVERSE IMPACTS

Wetlands, wetland buffers, the Youghiogheny River, old-growth hemlock forest, and specimen trees coexist to create a high value ecological system within and surrounding the project area. All of the proposed design alternatives described in Section 3.2 involve design components that unavoidably impact one or multiple components of the ecology of the area. Although impacts associated with clearing and grading will be mitigated, it will alter the existing ecology of the area. Mature areas of old-growth hemlock forest to be removed will be replaced with young trees during reforestation that will take time to mature and fully integrate, and topography of wetlands and wetland buffers will be impacted depending on which design option is pursued. Changes in the existing habitat can have an effect on the species that inhabit and utilize the areas and the services they provide.

To ensure the area maintains its high ecological value and functionality, mitigation will be performed in the form of reforestation; any areas that are not required for maintenance of the bridge and roadway will be reforested and reverted to parkland. When implementing a reforestation strategy, care will be taken to select species that are prominent to the area, such as Eastern Hemlocks and other native species, to be cohesive with the surrounding forest. Additionally, larger plant stock can be utilized to lessen the amount of time required for maturation of the reforestation area. Ultimately, while there will be unavoidable impacts and changes to the existing ecological system, the goal will be to apply a reforestation plan that will provide immediate, valuable ecological function, and that with time will continue to integrate seamlessly into the surrounding areas.

The extents of the impacts to the various components of the ecological system are quantified for each design alternative and are provided in Section 3.3.

## 2.4 FISH AND WILDLIFE

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### EXISTING CONDITIONS

Whitetail deer are one of the more numerous mammals found in the region. Black bear and bobcat also inhabit the area, but are less common. Smaller mammals, including grey and red fox, racoon, opossum, beaver, mink, muskrat, and woodchuck, are all common within the region.

Game birds such as wild turkey, ruffed grouse, and woodcock are prevalent; and non-game species including several hawk and songbird species are present.

Reptiles found in the area include snapping turtle, painted turtle, smooth green snake, timber rattlesnake, garter snake, and black rat snake. Resident amphibians consist of green frogs, American toads, spotted salamanders, and red spotted newts.

Several fish species are found within the Youghiogheny that are dependent on good quality surface waters. Variations in water levels and temperature are factors that can adversely affect fish populations. Most common species observed in the river include Brown Trout, Rainbow Trout, Smallmouth Bass, Walleye, Largemouth Bass, Bluegill, Pumpkinseed, Rock Bass, Hog Sucker, Stoneroller, River Chub, Longnose Dace, Blacknose Dace, Creek Chub, Mottled Sculpin, Fantail Darter, and Carp.

Several rare, threatened, and endangered species have also been observed within the Youghiogheny region (LAB, 1996).

### POTENTIAL ADVERSE IMPACTS

Information provided by Maryland Department of Natural Resources (DNR) Wildlife Heritage Service provided information on the presence of rare, threatened, and endangered species unique to the project site (Appendix A). It has been determined that there are records of rare, threatened, and endangered species in the immediate vicinity of the project area. Habitat associated with three aquatic species is located along the south side of the project area, west of the Youghiogheny River. The area supports two globally rare, state-listed endangered subterranean invertebrate species, *Procotyla typhlops* (planarian) and *Caecidotea alleghenyensis* (crustacean), and the state rare epigeal invertebrate, *Paraplanaria dactyligera* (planarian). Any disturbance south of Swallow Falls Road and west of the river could impact the representative habitat and species in this location (Appendix A).

The United State Department of the interior Fish and Wildlife Service (USDI FWS) indicated that there is habitat associated with the Indiana Bat (*Myotis sodalists*) in the region of the project area, but that no critical habitat is found within the project area (Appendix B). Therefore, the project would be considered “not likely to adversely affect” the species based on the proposed project area. Effective January 20, 2023, concurrent with the development of this report, the status of the Northern Long-Eared Bat (*Myotis septentrionalis*) was changed to endangered. This status change will require additional assessment to determine if there is population of the species or if there is critical habitat for the species located within the project area. Habitat mapping for the Northern Long-Eared Bat is still under development with the USDI FWS; additional surveys will be performed once final mapping is complete and available for use.

Maryland DNR Environmental Review provided information obtained from a nearby Maryland Biological Stream Survey (MBSS) station that Creek Chub and Mottled Sculpin are fish species commonly found near the project area (Appendix C). Additionally, the river is stocked with adult trout approximately 2.5 miles upstream; therefore, depending on the time of year, flow, and in-stream conditions trout may be found in or near the project site.



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## 2.5 FOREST AND VEGETATION

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### EXISTING CONDITIONS

More than two-thirds of the Youghiogheny region is forested, predominantly with northern hardwoods such as Oak, Beech, Birch, Maple, Wild Cherry, Hickory, Ash, and Elm. White Pine and Hemlock stands provide breaks in the broadleaf deciduous communities, and Rhododendron and Mountain Laurel are found in various areas along streams in the region. The largest Hemlock and White Pines recorded in Maryland are located in Swallow Falls State Park (LAB, 1996). Forest stand delineations performed in 2017 and verified in 2020 were consistent with the typical species associated with the region. Stands comprised predominantly of old-growth Hemlock, Oak, Cherry, and Maple were observed within and adjacent to the project area.

### POTENTIAL ADVERSE IMPACTS

The project is located within Swallow Falls State Park and is part of a 37-acre grove of old-growth hemlock and pine, some of which are over 300 years old (*Youghiogheny*, 2022); the area is of a very high ecological value. All of the design alternatives described in Section 3.2 will involve some level of clearing of vegetation which will result in the permanent loss of forest area as well as the removal of several specimen old-growth hemlocks within the forest. Determination on whether a specimen tree should be removed or preserved was accomplished by evaluating the critical root zone (CRZ) of each specimen tree in relation to the limits of disturbance. Generally, specimen trees with a CRZ impact of greater than 33% were designated for removal, and specimen trees with CRZ impact of less than 33% were designated to be preserved. In order to mitigate for any clearing that is required during construction, the area will be reforested with native species that will mature to be cohesive and integral to the surrounding areas. The old-growth hemlock areas are primarily located north of Swallow Falls Road, both east and west of the Youghiogheny River. In order to preserve as much forest as possible, the project limits of disturbance will be as minimal as possible while still being able to accomplish the project goals.

Forest within and adjacent to the project area are considered Forest Interior Dwelling (FIDS) habitat for birds. The existing opening in the forest canopy over Swallow Falls Road is less than 30 feet wide. All of the design alternatives involve clearing which will increase the opening in the canopy over Swallow Falls Road. In order to minimize impact to FIDS habitat, roadway canopy cover will be reestablished as quickly as possible during reforestation efforts. Mitigation for impact to FIDS habitat will be included in the project as necessary.

The extent to which forest and specimen trees will be impacted will vary based on which design alternative is utilized. Impacts for each alternative are quantified in Section 3.3.

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## 2.6 GEOLOGICAL FEATURES

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### EXISTING CONDITIONS

Rock outcrops, waterfalls, mineral deposits, and elevations are all major geologic landform features that are associated with the Youghiogheny region. Minerals contained in the Youghiogheny region are

associated with sedimentary rocks including limestone, fire clay, high silica sandstones, peat, and coal (LAB, 1996).

### POTENTIAL ADVERSE IMPACTS

The project area contains features such as large rock outcroppings. The project will have minimal impacts to the existing geologic features. The concrete existing abutments and concrete footings will be removed in their entirety and the proposed abutments will be set further back from the edge of the river. The existing footings, including the central bridge pier, will be removed using mechanical processes such as jackhammering. The existing rock outcrop and abandoned stone abutment on the east side of the river will remain in place. The proposed abutment on the west side of the bridge is located behind a higher rock outcrop along the riverbank. The top several feet of the west outcrop may need to be removed to provide clearance for the aesthetic façade and to provide inspection access. The outcrop is comprised of weathered and layered sandstone and should be relatively easy to excavate.

## 2.7 HYDROLOGICAL FEATURES

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### EXISTING CONDITIONS

The Youghiogheny is unique due to its northward flow and the fact that it does not drain to the Chesapeake Bay, but to the Monongahela-Ohio-Mississippi River system. The Youghiogheny watershed has an extremely dense network of tributaries, with over 50 streams draining into the river within Maryland. One of the main man-made influences on surface hydrology of the Youghiogheny is the Deep Creek hydroelectric dam.

Garrett County contains over 6,000 acres of wetlands, many of which are mountain bogs. One of the most noted wetland areas in the Youghiogheny region is the Cranesville-Pine-Swamp. This wetland is recognized as a National Natural Landmark. The wetland maintains a natural, high-elevation, frost pocket and contains plant and animal life that is more commonly found in sub-arctic or glaciated regions. Another significant wetland area in the region is located at the headwaters of Millers Run in Mt. Nebo Wildlife Management Area. Several other small wetland complexes can be found in poorly drained areas along the river.

Floodplains along the Youghiogheny are confined by steep slopes to a relatively narrow corridor along the river (LAB, 1996).

### POTENTIAL ADVERSE IMPACTS

The project area contains several hydrologic wetland features along Swallow Falls Road and the Youghiogheny. All of the design alternatives include clearing of vegetation and grading of the land adjacent to the proposed roadway alignment, consisting of variations of similar design elements which will impact wetlands and wetland buffers within the project corridor. The primary cause of impacts to wetlands and wetland buffers will come from the grading that would be required for the different design alternatives. Descriptions of all proposed design alternatives are provided in Section 3.2 and detail the specific design elements associated with each alternative that would be imposing these impacts on the wetlands and associated buffers. Wetlands and buffers are located throughout the project area; west of the

Youghiogheny, wetlands are located both north and south of Swallow Falls Road, and east of the Youghiogheny, a wetland is located south of the roadway and directly adjacent to the river.

The actual extent of impact to wetlands and buffers varies and is dependent on the specific design alternative that is utilized. Impacts are quantified for each alternative in Section 3.3.

## **2.8 WATER QUALITY**

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### **EXISTING CONDITIONS**

Overall water quality in the Youghiogheny is chemically, physically, and biologically good. Water quality is good enough within the river to support healthy trout populations (LAB, 1996).

### **POTENTIAL ADVERSE IMPACTS**

The bridge being replaced crosses over the Youghiogheny River. The Youghiogheny is a Use III-P stream that is seasonally stocked with adult trout. In order to maintain healthy fish populations, it is critical to minimize sediment transport from the work site. Appropriate erosion and sediment control (ESC) and best management practices (BMP) will be utilized to preserve water quality throughout construction, preventing any adverse impacts on water quality as a result of the project. Additionally, for all alternatives, a stormwater management waiver will be pursued. It was determined that the clearing and grading required to construct treatment facilities would offset any benefits that would be provided. Leaving more of the existing habitat intact is the preferred option and will maintain water quality through the natural existing conditions.

## **2.9 EXISTING LAND USE**

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### **EXISTING CONDITIONS**

Current land use of the corridor reflects past settlement patterns and has changed little throughout the years. The lack of change and development has left riverbanks in their natural condition and has resulted in State River designation. The towns of Oakland, Friendsville, and Crellin still exist along the river. Farming occurs in the Pleasant Valley region around Oakland and in the Sang Run area. The Penelec Deep Creek Power Plant is located at Hoyes Run. There is selective timber harvesting that occurs along the river corridor; however, land within the Youghiogheny River valley is primarily forested with single-family homes (LAB 1996).

The primary land use within the project area is associated with Swallow Falls State Park, and the Youghiogheny River is designated as a wild and scenic river corridor by the state. The Wild and Scenic Rivers Act outlines the regulations which projects must follow that propose development within wild and scenic rivers and the associated corridor.

### **POTENTIAL ADVERSE IMPACTS**

In order to complete the project, it may be necessary to perform work outside the limits of the current right-of-way associated with the existing bridge and roadway. Doing so could impose impacts onto the surrounding park lands, where park land may need to be converted to right-of-way for temporary

construction access and long-term roadway maintenance requirements. If right-of-way changes are necessary, any areas that were previously right-of-way area, that are no longer required for roadway maintenance, will be reforested, and returned to park land. The potential impact to park land will vary depending on the specific design alternative that is chosen. Additional right-of-way information, including a table quantifying potential temporary and permanent impacts to park land, are provided in Section 3.3.4.

## **2.10 HISTORIC AND CULTURAL RESOURCES**

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### **EXISTING CONDITIONS**

There are no registered historic structures located within the Youghiogheny corridor. There are many archeological sites located along the river including stone burial mounds, rock shelters, small hunting stations, and village sites. Most of these sites occur in level upland areas of tributaries to the Youghiogheny (LAB, 1996).

### **POTENTIAL ADVERSE IMPACTS**

No adverse impacts to historic or archeological sites are anticipated. Coordination with the Maryland Historic Trust (MHT) indicates there are no registered historic sites within the project area (Appendix D), and a Phase I Archeological Survey was completed which revealed no sites of archeological significance within the project area.

## **2.11 INTERESTS AND CONCERNS OF PRIVATE LANDOWNERS**

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### **EXISTING CONDITIONS**

Most private property owners highly value their privacy and want to be able to use their land as they see fit. However, they are also concerned about the environmental quality of the river and want to see the river remain in its natural condition. Since the State's wild and scenic designation of the river, a primary concern of property owners has been regarding a decrease in property values associated with regulations that the State could impose and the potential use of eminent domain to acquire private land (LAB, 1996).

### **POTENTIAL ADVERSE IMPACTS**

No adverse impacts are anticipated to the interest and concern of private landowners. The project is contained entirely within easement areas or public land managed by DNR; no private landowners will be directly impacted by this project. A public hearing will be held where local residents can obtain information about the project and will be able to voice any concerns.

## **2.12 WILD CHARACTER**

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### **EXISTING CONDITIONS**

With more than two-thirds of the Youghiogheny region being forested and having rugged steep terrain, it leaves much of the area undeveloped. Much of the river is inaccessible, except by trail, and is left in its natural and undisturbed condition (LAB 1996).

## POTENTIAL ADVERSE IMPACTS

The project will be replacing an existing bridge and will not be proposing any new development that does not already exist in the area. Aspects of the project including removal of the pier within the river and removal of abutments along the riverbanks will serve to improve the character of the river by restoring the original condition and improving conditions for recreational uses such as kayaking and angling. There will be unavoidable impacts to the old growth hemlock forest along the length of the project, however, these areas will be reforested to mitigate for any impacts, as discussed in Section 2.3. In time, these areas of reforestation will mature and integrate into the surrounding environment. Clearing and grading will be required on the riverbanks to install the new bridge abutments as well as to accommodate the wider bridge and roadway. The new bridge and abutments will alter the appearance in the area and will be visible from the Youghiogheny River corridor.

The Maryland Code, Natural Resources Article 8-402(d)(3) defines a wild river as a “free-flowing river whose shoreline and related land are undeveloped, inaccessible except by trail, or predominantly primitive in a natural state for at least 4 miles of the river length.” Based on this definition, none of the proposed design alternatives will impact on the overall wild character of the river or corridor. However, it will not be possible to replace the existing bridge with a modern bridge that meets current Federal Highway Administration standards without there being some impact to the corridor within the project area. Every effort has been made to reduce impacts while still being able to accomplish the project goals. Mitigation will be implemented in the project as necessary to restore the area following construction.

## 2.13 SCENIC AND AESTHETIC CHARACTER

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### EXISTING CONDITIONS

Scenic resources within the region such as rock promontories and waterfalls are some of the outstanding features of the river valley required to be protected under the scenic and wild rivers act. The riverbanks are predominantly forested with minimum development disturbing the natural conditions (LAB, 1996).

### POTENTIAL ADVERSE IMPACTS

All of the proposed design alternatives involve clearing of forest along the length of the project area as well as removal of the existing pier within the river and abutments along the riverbanks. Removal of environmentally sensitive habitat such as old growth hemlock forest and specimen trees along Swallow Falls Road will be unavoidable as previously discussed in Section 2.5. Clearing and grading will be required for the installation of abutments for the new bridge as well as to accommodate the wider bridge and roadway. The new bridge, abutments, and forest clearing will alter the appearance in the area and will be visible from the Youghiogheny River corridor. The Maryland Code, Natural Resources Article 8-402(d)(2) defines a scenic river as a “free-flowing river whose shoreline and related land are predominantly forested, agricultural, grassland, marshland, or swampland with a minimum of development for at least 2 miles of the river length.” Based on this definition, none of the proposed design alternatives will impact the overall scenic character of the river or corridor. However, it will not be possible to replace the existing bridge with a modern bridge that meets current Federal Highway Administration standards without there being some impact to the corridor within the project area. Every effort has been made to reduce impacts while still

being able to accomplish the project goals. Mitigation will be implemented in the project as necessary to restore the area following construction.

To ensure the replacement bridge is aesthetically pleasing and seamless with the surroundings, the proposed bridge will be a single-span steel girder bridge with a faux concrete arch façade. For users at river level, the façade and barriers will use a stacked stone formliner to give the appearance of a stone arch bridge. The existing center pier and abutments will be removed with the new abutments set back approximately 20-feet from the edge of the river. The entire superstructure will be outside of the 100-year floodplain. The aggregate effect will be to eliminate an unnatural choke point along the river and allow the river to flow freely through the corridor. For users at roadway level, the removal of the existing one-lane ACROW bridge will eliminate a narrow, tall, metal, and generally unattractive visual element within the scenic river corridor across the river and replace it with an open crossing enhanced with stacked stone formliner on modest height bridge railings. The proposed roadway cross-section will re-establish dual lanes of traffic while providing safe conveyance for cyclists that ride along Swallow Falls Road and pedestrians that invariably walk out onto the bridge to view the falls.

## 2.14 VISITOR EXPERIENCE

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### EXISTING CONDITIONS

The Youghiogheny offers excellent recreational opportunities. Swallow Falls State Park, Herrington Manor State Park, Mt. Nebo Wildlife Management Area, and Deep Creek Lake State Park provide various recreational activities from boating to hunting. The Youghiogheny is considered one of the best whitewater rivers on the East Coast. The Youghiogheny River sustains a healthy trout fishery including brown and rainbow trout. Studies indicate the presence of reproducing trout populations in every major tributary. The river is also known for excellent bass fishing, being one of the only native smallmouth bass streams in Maryland (LAB, 1996).

### POTENTIAL ADVERSE IMPACT

There will be temporary impacts to the visitor experience during the construction process. There may be impacts to access while construction is ongoing, including periods of road closures, and existing parking areas may be used during construction as staging areas. The Youghiogheny is classified as a Use III-P water body and, therefore, construction schedules must adhere to in-stream closures where no work can be performed October 1 through April 30. Any work that is being performed outside of the designated closure period has the potential to impact anglers visiting the area.

## 3.0 IMPACT MINIMIZATION

### 3.1 MINIMIZATION

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In order to minimize and avoid impacts to the environmental resources associated with the project area, several design alternatives have been analyzed to determine how to best accomplish the projects goals while balancing the extent of impacts to the environmental resources and the community. An original alignment study (Appendix E) was completed in October 2018. The alternatives have been further

developed and plan exhibits displaying the proposed design for each current alternative described hereafter are provided in Appendix F.

### 3.2 DESIGN ALTERNATIVES

#### OPTION 1 – RECONSTRUCT BRIDGE ON EXISTING ALIGNMENT WITH TEMPORARY BRIDGE TO NORTH

This option proposes to maintain the existing permanent bridge centerline based on a 25-mph design speed. The proposed bridge structure will be located along the existing centerline. The existing single span Acrow panel truss structure will be removed and relocated to the north of the existing bridge using a temporary roadway shift, based on a 15-mph design speed, to allow Swallow Falls Road to remain open to traffic during the construction of the new bridge. Temporary pavement and abutments would be constructed in a pre-stage and then the Acrow bridge could be lifted and repositioned under a weekend closure. Traffic would shift to the temporary bridge while the new bridge is constructed and then removed upon completion of the new bridge. The proposed profile will be raised several feet to accommodate the deeper bridge girders required to facilitate removal of the center pier in the river. No stormwater management facilities were included with this option. Limits of disturbance to the south side of the roadway are confined to the area required for grading to accommodate the new profile and roadway section. This alternative creates additional impacts to the north side of the proposed roadway due to the temporary alignment.

#### OPTION 1B – RECONSTRUCT BRIDGE ON EXISTING ALIGNMENT USING SLIDE-IN BRIDGE CONSTRUCTION

This option proposes to maintain the existing permanent bridge centerline based on a 25-mph design speed. The proposed bridge structure will be located along the existing centerline. The new bridge superstructure would be constructed on temporary abutments located north of the roadway. Once ready, the road would be closed, and traffic detoured for approximately 1 month. During this time, the existing bridge would be demolished, new abutments constructed, and the new bridge superstructure hydraulically jacked laterally into place. Once the approach roadway tie-ins are reconstructed, the road would be reopened to traffic. The proposed profile will be raised several feet to accommodate the deeper bridge girders required to facilitate removal of the center pier in the river. No stormwater management facilities were included with this option. Limits of disturbance to the south side of the roadway is confined to the area required to grade out to accommodate the new profile and roadway section. This alternative creates additional impacts to the north side of the proposed roadway due to the work zone required to construct the new bridge superstructure off alignment. The impacts for this option exceed those for Option 1 because the full width of the proposed permanent bridge must be built offset to the north compared to Option 1 where only the one-lane Acrow bridge is shifted to the north. Due to impacts exceeding Option 1, impacts were not calculated, and an exhibit was not developed.

#### OPTION 1C – RECONSTRUCT BRIDGE ON EXISTING ALIGNMENT USING TRADITIONAL CONSTRUCTION

This option proposes to maintain the existing permanent bridge centerline based on a 25-mph design speed. The proposed bridge structure will be located along the existing centerline. The road would be

closed, and traffic detoured for approximately 3 months. The new bridge would be constructed using mostly traditional means with some precast elements to accelerate construction. The proposed profile will be raised several feet to accommodate the deeper bridge girders required to facilitate removal of the center pier in the river. No stormwater management facilities were included with this option. Limits of disturbance to both the north and south sides of the roadway are confined to the area required for grading to accommodate the new profile and roadway section.

#### OPTION 2 – CONSTRUCT BRIDGE ON OFFSET ALIGNMENT

This option proposes to shift the permanent bridge centerline to the north based on a 25-mph design speed. The existing single span Acrow panel truss structure will remain in place along with the existing roadway to allow Swallow Falls Road to remain open to traffic during the construction of the new bridge. This option allows the road to remain open to traffic throughout construction. The proposed profile will be raised several feet to accommodate the deeper bridge girders required to facilitate removal of the center pier in the river. No stormwater management facilities were included with this option. Limits of disturbance to the north side of the roadway are confined to the area required for grading to accommodate the new profile and roadway section. Impacts to the south side of the new roadway are generally limited to within the abandoned roadbed that is proposed for reforestation after the new bridge has been opened to traffic and the existing bridge has been removed.

#### OPTION 2B – CONSTRUCT BRIDGE ON OFFSET ALIGNMENT AND PROVIDE INCREASED STORMWATER MANAGEMENT TREATMENT

This option proposes to shift the permanent bridge centerline to the north based on a 25-mph design speed. The existing single span Acrow panel truss structure will remain in place along with the existing roadway to allow Swallow Falls Road to remain open to traffic during the construction of the new bridge. This option allows the road to remain open to traffic throughout construction. The proposed profile will be raised several feet to accommodate the deeper bridge girders required to facilitate removal of the center pier in the river. This option includes stormwater management facilities to eliminate point discharges into the river while providing treatment to the maximum extent practicable. Limits of disturbance to the north side of the roadway are more significant for this option, compared to Option 2, due to the inclusion of the stormwater management facilities and associated grading limits. Impacts to the south side of the new roadway are slightly larger than for Option 2 since most of the stormwater management facilities south of the road can be installed in the abandoned roadbed. However, these facilities preclude any meaningful reforestation after the new bridge has been opened to traffic and the existing bridge has been removed.

#### OPTION 2C – CONSTRUCT BRIDGE ON OFFSET ALIGNMENT USING SOLDIER PILE RETAINING WALLS

This option proposes to shift the permanent bridge centerline to the north based on a 25-mph design speed. The existing single span Acrow panel truss structure will remain in place along with the existing roadway to allow Swallow Falls Road to remain open to traffic during the construction of the new bridge. This option allows the road to remain open to traffic throughout construction. The proposed profile will be raised several feet to accommodate the deeper bridge girders required to facilitate removal of the center pier in the river. No stormwater management facilities were included with this option. The existing grades to the north side of the roadway are higher than the existing and proposed roadway profiles. To minimize



limits of disturbance to the north side of the roadway, soldier pile retaining walls are proposed to reduce the area required for grading to tie into the proposed road. Impacts to the south side of the new roadway are generally limited to within the abandoned roadbed which is proposed for reforestation after the new bridge has been opened to traffic and the existing bridge has been removed. A graphic rendering of this option is provided in Appendix G.

#### OPTION 2D – CONSTRUCT BRIDGE ON OFFSET ALIGNMENT USING RAISED PROFILE

This option proposes to shift the permanent bridge centerline to the north based on a 25-mph design speed. The existing single span Acrow panel truss structure will remain in place along with the existing roadway to allow Swallow Falls Road to remain open to traffic during the construction of the new bridge. This option allows the road to remain open to traffic throughout construction. The proposed profile will be raised several feet to accommodate the deeper bridge girders required to facilitate removal of the center pier in the river. No stormwater management facilities were included with this option. The existing grades to the north side of the roadway are higher than the existing and proposed roadway profiles. To minimize limits of disturbance to the north side of the roadway, the profile is raised an additional several feet (compared to Option 2C) to eliminate the need for soldier pile retaining walls to reduce the area required for grading to tie into the proposed road. The impacts are reduced from Option 2, but slightly larger than Option 2C. Impacts to the south side of the new roadway are generally limited to within the abandoned roadbed which is proposed for reforestation after the new bridge has been opened to traffic and the existing bridge has been removed. A graphic rendering of this option is provided in Appendix G.

**3.3 IMPACT ANALYSIS**

**3.3.1 ENVIRONMENTAL IMPACTS**

Impacts associated with each design alternative were evaluated based on the proposed limits of disturbance (LOD) for each option. Results of the analysis are provided in the table below.

**Table 1 – Design Alternative Environmental Impacts**

	Forest Clearing (acres)	Specimen Tree Removal	Specimen Trees with CRZ Impact to be Preserved	Tree Removal 12"-29.9"	Wetland Impacts (SF)	Wetland Buffer Impacts (SF)	Temporary WUS Impacts (SF)	Permanent WUS Impacts (SF)
<b>Option 1</b>	0.96	7	7	163	1,378	6,588	4,686	58
<b>Option 1C</b>	0.68	4	6	110	1,373	6,585	4,378	0
<b>Option 2</b>	1.27	11	8	227	921	4,069	4,689	58
<b>Option 2B</b>	1.70	13	9	269	1,675	5,724	4,698	58
<b>Option 2C</b>	1.00	7	7	183	922	4,052	4,696	58
<b>Option 2D</b>	1.21	11	6	222	921	4,067	4,689	58

**Notes:** 1.) Option 1B was considered during preliminary investigations, but was not continued through further design development due to anticipated increased natural resource impacts as compared to Option 1 and the potential road closure impact to the community. No impact calculations are available. 2.) Specimen trees with CRZ impact designated to be preserved will receive appropriate tree protection measures to prevent unnecessary harm or impact. Tree protection measures include but are not limited to root pruning and tree protection fencing.

### 3.3.2 COST OF CONSTRUCTION

Estimated cost of construction was evaluated for each design alternative and are outlined in Table 2.

**Table 2 – Estimated Cost of Construction**

Alternatives	Estimated Construction Cost Including Contingency
<b>Option 1</b>	\$5,114,300
<b>Option 1B</b>	\$5,182,400
<b>Option 1C</b>	\$4,736,800
<b>Option 2</b>	\$4,699,700
<b>Option 2B</b>	\$4,990,200
<b>Option 2C</b>	\$5,449,700
<b>Option 2D</b>	\$4,699,700

### 3.3.3 ROADWAY CLOSURE

Roadway closures would be required for the completion of some design alternatives as outlined in Table 3. In the event of roadway closures, detour routes would need to be utilized. The shortest detours to a southern and northern crossing of the Youghiogheny are 15.4 miles and 18 miles, respectively. Figures 2 and 3 below highlight these detour route options.

**Table 3 – Roadway Closure Requirements**

Alternatives	Required Detour
<b>Option 1</b>	Weekend roadway closure
<b>Option 1B</b>	Initial Phase: Short-term 30–60-minute closures or a longer single weekend closure Later Phase: 1 month closure
<b>Option 1C</b>	3 months
<b>Option 2</b>	None
<b>Option 2B</b>	None
<b>Option 2C</b>	None
<b>Option 2D</b>	None

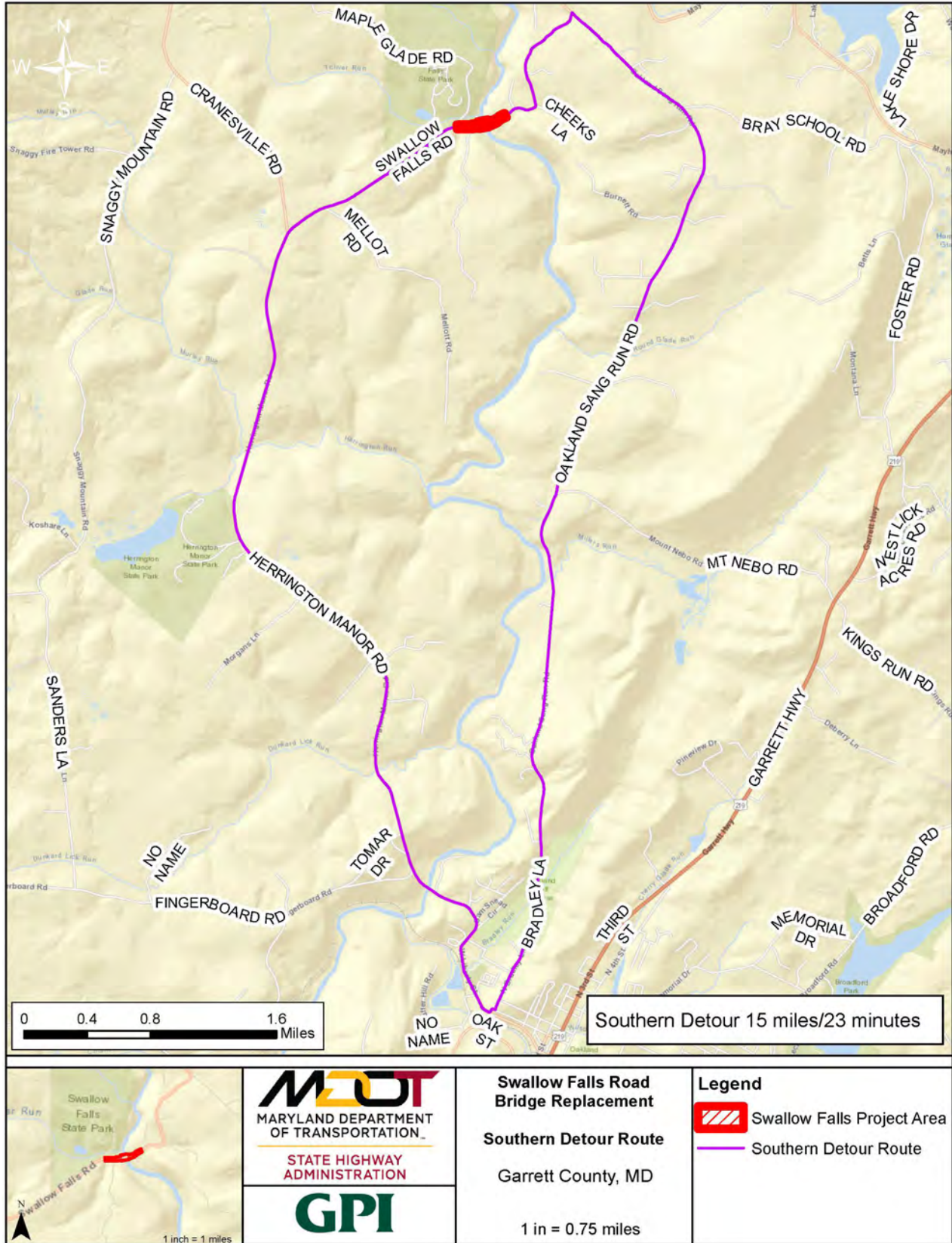


Figure 2 – Southern Detour Route

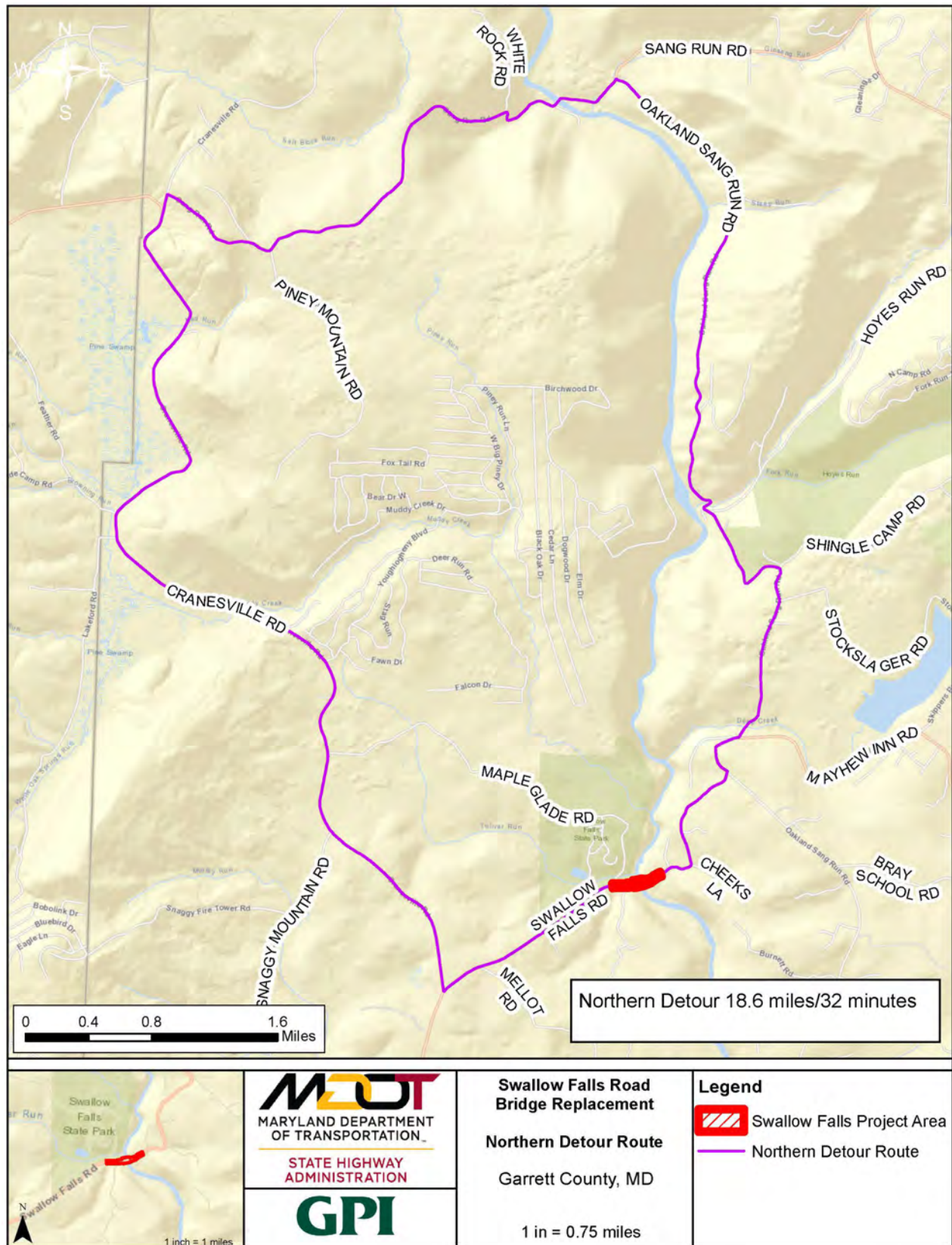


Figure 3 – Northern Detour Route

Roadway closures would also impact emergency response times if a detour were required to access the area. Personnel and equipment from the Maryland State Police Barracks and the Deep Creek Volunteer Fire Company, both located in McHenry, would have significant detours if responding to an emergency situation west of the Swallow Falls Bridge where both private properties and the main entrance and usage area of Swallow Falls State Park are located. These detours are outlined in Figures 4 and 5.

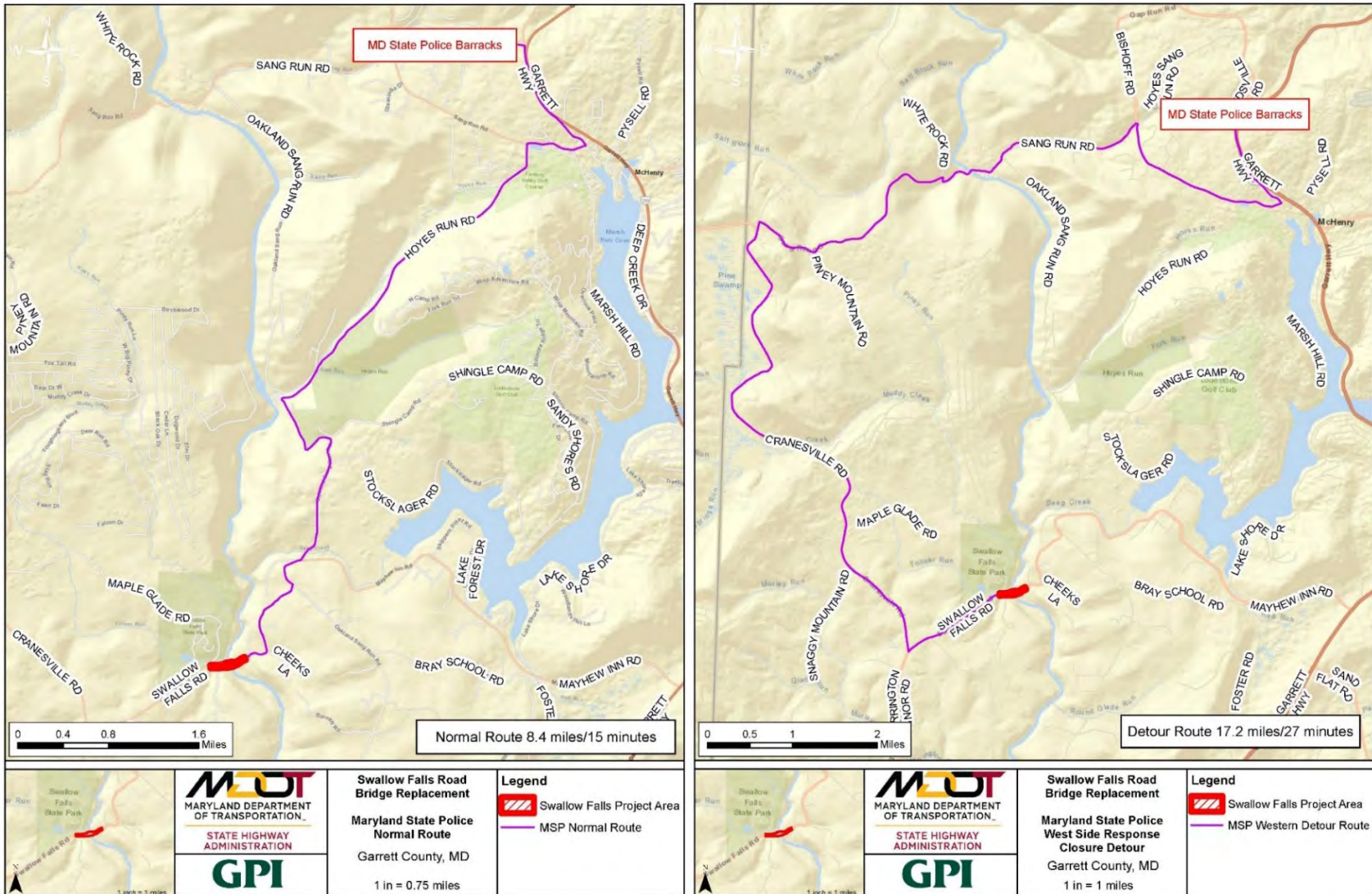


Figure 4 – Maryland State Police normal route to Swallow Falls Bridge (left) and detour route to the western side of the bridge during a closure (right).

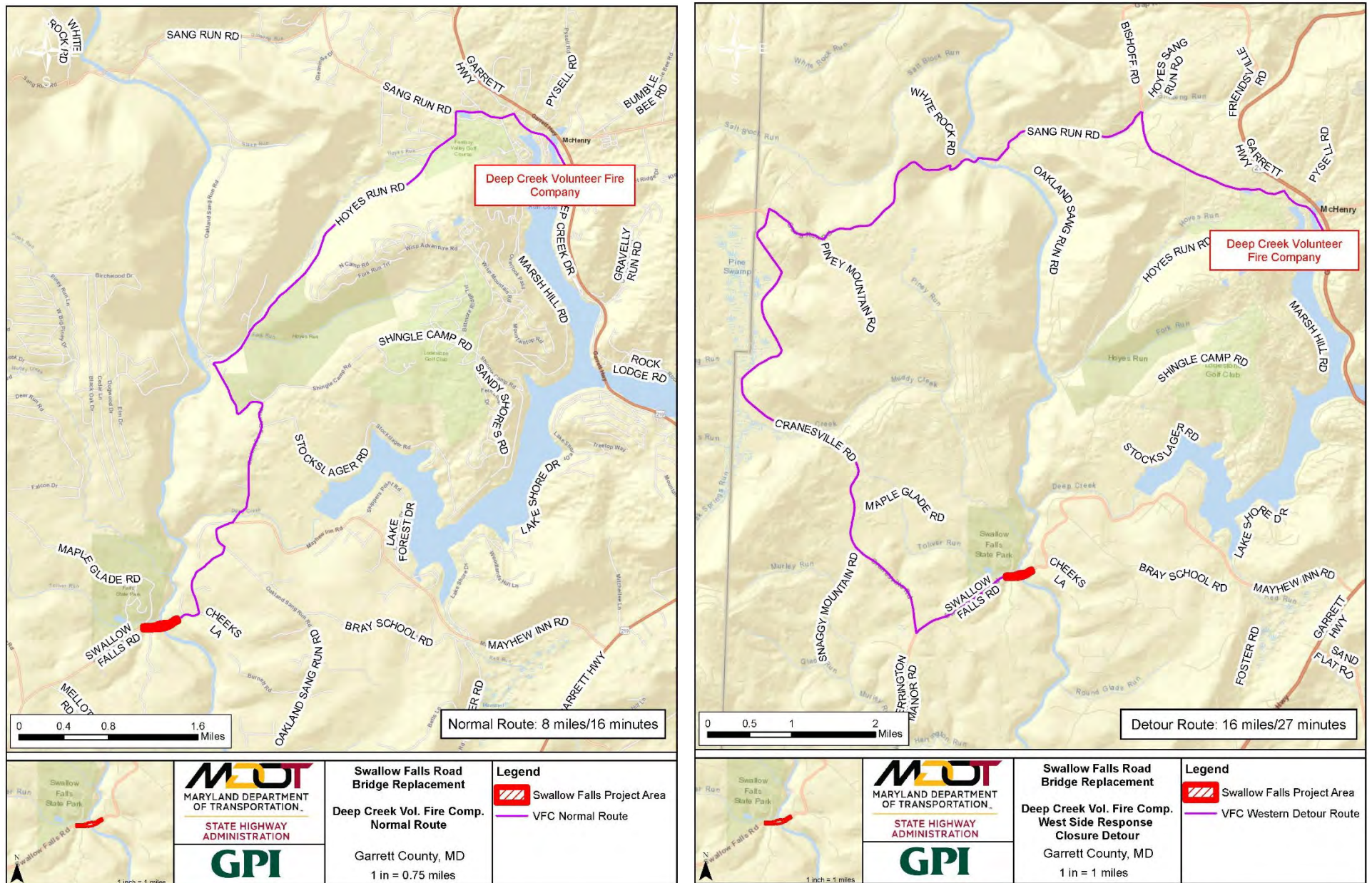


Figure 5 – Deep Creek Volunteer Fire Company normal route to Swallow Falls Bridge (left) and detour route to the western side of the bridge during a closure (right).

### 3.3.4 PARKLAND IMPACTS

The existing bridge and roadway are contained within a prescriptive easement granted to the County by Pennsylvania Electric Company as outlined in a letter provided to the County Commissioners in 1954 (Appendix H). The terms of this prescriptive easement establish a boundary located from the centerline of an area of land 50-feet in width, allowing for additional width as necessary for any required side slopes of cut and fill.

All of the proposed design alternatives will require some work to be performed outside of this current easement area, within areas that are currently designated as parkland. Some of these impacts will be temporary in nature that will be necessary for construction-related activities such as staging areas and temporary roadway construction. Permanent impacts will be considered as any area encompasses permanent elements of the new bridge and relocated roadway that fall outside of the existing prescriptive easement. The goal will be to result in no net increase in impacts to parkland if feasible. While it may be required to delineate new easement limits depending on the chosen design alternative, any area that will no longer be required for the new bridge and relocated roadway, will be reforested, and reverted back to parkland following construction. Exhibits displaying the existing prescriptive easement in relation to the estimated temporary and permanent parkland impacts for each alternative are provided in Appendix I.

Parkland impacts associated with each design alternative are outlined in Table 4. It is understood that the project is still in the planning stages and that any impacts calculated at this stage are estimated based on the information available at this time. The delineation and description of property rights necessary to build the preferred alternative will be refined as the design develops.

**Table 4 - Estimated Parkland Impacts**

Existing Easement Area (acres) – 2.39					
Alternatives	New Easement Area (acres)	Temporary Impacts (acres)	Permanent Impacts (acres)	Vacated Easement (acres)	Net Impacts to Parkland Area (acres)
Option 1	2.39	0.61	0.01	0	-0.01
Option 1C	2.39	0.33	0.01	0	-0.01
Option 2	2.07	0.53	0.47	0.79	0.32
Option 2B	3.01	0.49	0.92	0.3	-0.62
Option 2C	2.16	0.39	0.33	0.56	0.23
Option 2D	2.41	0.25	0.69	0.66	-0.02

**Note: Option 1B was considered during preliminary investigations but was not continued through further design development due to anticipated increased natural resource impacts as compared to Option 1 and the potential road closure impact to the community. No impact calculations are available.**



## 4.0 ANALYSIS AND CONCLUSIONS

During the analysis of the various alternatives, several factors were taken into consideration. Valuable natural resources within the project area are a critical component when deciding which design alternative is the best option. Other key factors to consider include how the proposed project will affect the public, the local community, and public safety.

After assessing all of the proposed design alternatives, it was determined that Options 1, 1B, 1C, 2, and 2B all imposed too much impact on the natural resources within the project area. Options 1, 1B, and 1C all also include road closures which will have too great of an impact on the local residents of the community who use Swallow Falls Road on a regular basis along with the safety of local residents and the public frequenting the park. Additionally, a public-school bus route utilizes Swallow Falls Road bridge and a closure to the bridge would significantly increase time and cost for the affected bus route. Extended road closures would also pose a concern to the safety of local residents as well as public utilizing the park, as it could significantly increase the travel distance and response time for emergency services that normally utilize the Swallow Falls Road bridge. Information provided by Southern Garrett County Fire and Rescue indicates that emergency services provided to the Swallow Falls Bridge area are shared between multiple jurisdictions. The bridge area receives fire, rescue, and ambulance services from both Oakland Volunteer Fire Department and from the Deep Creek Volunteer Fire Company. Oakland has the primary responsibility, with Deep Creek serving as a backup when additional support is needed. Police services are equally shared between the Maryland State Police and the Garrett County Sheriff's Office, with no primary designation. According to the information provided, if the bridge were to be closed during construction, there would be minimal impact to response time for emergency services provided from Oakland, as there are comparable routes to access both the eastern and western sides of the bridge. However, if emergency services were required west of the bridge, and emergency response were only available from the Maryland State Police or the Deep Creek fire department, both located east of the bridge, it would significantly increase the response time to the area. If Maryland State Police were required west of the bridge during a closure, the response time would increase from 8.4 miles and 15 minutes to 17.2 miles and 27 minutes. If Deep Creek Volunteer Fire Company were required west of the bridge during a road closure, the response time would increase from 7.9 miles and 15 minutes to 16.6 miles and 27 minutes.

Options 2C and 2D were determined to have the best balance between environmental and community impacts, while maintaining the project goals. The environmental impacts are lessened with each of these proposed designs, and the roadway will be able to remain open for the duration of the construction, imposing minimal impact on visitors and local traffic while also maintaining necessary access for any emergency services. It is important to note that stormwater management was excluded from each of these proposed alternatives. This was a careful decision taking into consideration the environmental impacts associated with the construction of stormwater management facilities. It was determined that the unavoidable impacts to the old-growth hemlock forest, wetlands, wetland buffers, and specimen trees required for the inclusion of stormwater management would offset any benefit provided. Final determination on which design alternative will be utilized is still under evaluation.

Given that this project involves the replacement of an existing bridge, an exemption will be required in accordance with COMAR 08.15.03.03. As detailed in this report, the existing conditions and natural

resources within the project area prove to be challenging constraints, which would cause unnecessary hardship to the project if required to be in strict adherence with the Scenic and Wild River regulations. The designated design alternative will result in visual changes to the riverbanks and along the corridor that will be visible from the Youghiogheny River but will not impact the wild or scenic character of the river or corridor overall. Impacts will be localized to the project area, but these will not affect the scenic and wild character as defined by The Maryland Code, Natural Resources Article 8-402(d)(2) and 8-402(d)(3). Local impacts include the grading and clearing of existing old growth hemlock forest along the project to accommodate the new wider roadway, bridge, and new abutments as well as removal of the existing in-river center pier and old abutments. However, all impacts to the river will be temporary in nature being associated with maintenance of stream flow operations required to complete construction. The removal of the existing structures from within the river and on the riverbanks will enhance the scenic and aesthetic character of the river by restoring these features to their original conditions. Impacts to the forest will be restored following the completion of the project to ensure that the area maintains its scenic and aesthetic qualities. Reforestation efforts will include native plant stock found within the area so that in time as the reforestation matures, it will blend with the existing habitat to mitigate any clearing that will be required. Therefore, it can be ascertained that an exemption for this project would be consistent with the legislative intent of the Scenic and Wild Rivers Act and would not be injurious to the scenic and wild character of the river.

## 5.0 REFERENCES

Code of Maryland Regulations (COMAR). Title 8, Subtitle 15.

Annotated Code of Maryland, Natural Resource Article 8-402.

The Youghiogheny Scenic and Wild River Local Advisory Board (LAB). (1996). *Maryland Scenic and Wild Rivers, The Youghiogheny*.

*Youghiogheny Grove Natural Area – Swallow Falls State Park*. (2022). Old-Growth Forest Network.  
<https://www.oldgrowthforest.net/md-youghiogheny-grove-natural-area-swallow-falls-state-park>

## **Appendix A – DNR WHS Rare, Threatened, and Endangered Species**



*Larry Hogan, Governor*  
*Boyd Rutherford, Lt. Governor*  
*Mark Belton, Secretary*  
*Joanne Throwe, Deputy Secretary*

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May 7, 2019

Mr. Marc Halpin  
Greenman-Pedersen, Inc.  
11000 Broken Land Parkway  
Suite 500  
Columbia, MD 21044

**RE: Environmental Review for GA415ZM1 Replacement of Garrett County Bridge No. G-0020 on Swallow Falls Road over Youghiogheny River, Garrett County, Maryland.**

Dear Mr. Halpin:

The Wildlife and Heritage Service has determined that there are the following records of rare, threatened and endangered species documented within the vicinity of the existing bridge which may be impacted by the proposed replacement:

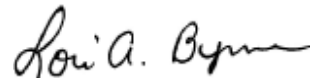
In the immediate proximity of the existing bridge are two aquatic species residing within groundwater and an associated spring emergence area along the south side of Swallow Falls Rd., west of the Youghiogheny River. The main spring which parallels Swallow Falls Road to its confluence with the river supports *Procotyla typhlops*, a globally rare, state-listed endangered subterranean planarian and a state rare epigeal planarian, *Paraplanaria dactyligera*. Expansion of the existing road or development of a new approach and associated disturbances on the west side of the Youghiogheny River will likely have a negative impact on these species and if this expansion were to occur south of the existing Swallow Falls Road it would almost certainly cause the extirpation of both planaria species at the site. The wetland here is designated in state regulations as a Nontidal Wetland of Special State Concern, and is regulated by Maryland Department of the Environment. Your project may need review by MDE for any necessary permits associated with this wetland. The actual boundaries of the NTWSSC and its associated 100-foot upland buffer would ultimately need to be determined on site.

In general, all seeps and springs and their catchment basins in the area should also be avoided as several within Swallow Falls State Park and adjacent Garrett State Forest also support the state-listed endangered and globally rare Allegheny spring isopod, *Caecidotea alleghenyensis*. This species' entire global range is limited to just a small portion of northwestern Garrett County with Swallow Falls State Park being the epicenter of that distribution.

Any construction along the Youghiogheny River must also be performed with great care as this reach of the river supports the Ocellated Darner (*Boyeria grafiana*), a state highly rare dragonfly. The state-listed endangered Allegheny Hellbender (*Cryptobranchus allegheniensis*) has also been recently detected downstream of the project area but may occur closer. This species is sensitive to sediment and temperature pollution, particularly during the late summer and fall breeding season.

Thank you for allowing us the opportunity to review this project. If you should have any further questions regarding this information, please contact me at (410) 260-8573.

Sincerely,

A handwritten signature in black ink that reads "Lori A. Byrne". The signature is written in a cursive, flowing style.

Lori A. Byrne,  
Environmental Review Coordinator  
Wildlife and Heritage Service  
MD Dept. of Natural Resources

ER# 2019.0422.ga  
Cc: D. Feller, DNR

## **Appendix B – USDI FWS Rare, Threatened, Endangered Species**



# United States Department of the Interior



## FISH AND WILDLIFE SERVICE

Chesapeake Bay Field Office  
177 Admiral Cochrane Drive  
Annapolis, Maryland 21401  
<http://www.fws.gov/chesapeakebay>

December 21, 2018

Melissa Ryder  
Greenman-Pedersen, Inc.  
10977 Guilford Road  
Annapolis Junction, MD 20701

*RE: Replacement of Small Structure No. G-0020 on Swallow Falls Road over the Youghiogheny River*

Dear Melissa Ryder:

This responds to your letter, received October 11, 2018, requesting information on the presence of species which are federally listed or proposed for listing as endangered or threatened within the vicinity of the above referenced project area. We have reviewed the information you enclosed and are providing comments in accordance with section 7 of the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*).

This project as proposed is “not likely to adversely affect” the endangered, threatened, or candidate species listed on your IPaC species list because while the project is within the range of the species, it is unlikely that the species would occur within the project area that was submitted. Therefore, no Biological Assessment or further section 7 Consultation with the U.S. Fish and Wildlife Service is required. Should project plans change, or if additional information on the distribution of listed or proposed species becomes available, this determination may be reconsidered.

This response relates only to federally protected threatened or endangered species under our jurisdiction. For information on the presence of other rare species, you should contact Lori Byrne of the Maryland Wildlife and Heritage Division at (410) 260-8573.

An additional concern of the Service is wetlands protection. Federal and state partners of the Chesapeake Bay Program have adopted an interim goal of no overall net loss of the Chesapeake Bay’s remaining wetlands, and the long term goal of increasing the quality and quantity of the Chesapeake Bay’s wetlands resource base. Because of this policy and the functions and values wetlands perform, the Service recommends avoiding wetland impacts. All wetlands within the project area should be identified, and if construction in wetlands is proposed, the U.S. Army Corps of Engineers, Baltimore District, should be contacted for permit requirements. They can be reached at (410) 962-3670.



We appreciate the opportunity to provide information relative to fish and wildlife issues, and thank you for your interests in these resources. If you have any questions or need further assistance, please contact Trevor Clark at (410) 573-4527.

Sincerely,

A handwritten signature in blue ink that reads "G. LaRouche". The signature is written in a cursive style with a large, stylized initial "G".

Genevieve LaRouche  
Supervisor



## **Appendix C – DNR Environmental Review**



**MARYLAND**  
DEPARTMENT OF  
NATURAL RESOURCES

*Larry Hogan, Governor*  
*Boyd Rutherford, Lt. Governor*  
*Mark Belton, Secretary*  
*Joanne Throwe, Deputy Secretary*

**Coordination Sheet for MD DNR Environmental Review Related to Project Locations**

Date of Request:  
May 16, 2018

Name of Requestor:  
NRT Guest

FMIS Number:  
GA415B21

Project Name and Location:  
Swallow Falls Road over Youghiogheny River

The Maryland Department of Transportation State Highway Administration on behalf of Garrett County proposes to replace Bridge G-02000 Swallow Falls Road over Youghiogheny River in Garrett County. A temporary bridge will be placed parallel to the permanent bridge to maintain traffic during bridge removal and construction. The temporary bridge will be removed when the new bridge is operational. Road work will be completed to safely transition the existing roadway to the new bridge. Work will occur on land owned by Maryland DNR.

NAME OF STREAM(S) (and MDE Use Classification) WITHIN THE STUDY AREA:  
Youghiogheny River (Use III)

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**DNR RESPONSE:**

√ Generally, no instream work is permitted in Use III streams during the period of October 1 through April 30, inclusive, during any year.

**ADDITIONAL RESOURCES NOTES:**

A nearby Maryland Biological Stream Survey (MBSS) station documents the following summary of findings for fish: Creek Chub and Mottled Sculpin.

Youghiogheny River is stocked with adult trout during the spring season approximately 2.5 miles upstream of the project location. Depending upon flow and in-stream conditions, small numbers of stocked trout may be found near the project site.

There are records of Crayfish located nearby this project site, which are in Greatest Conservation Need. Species of greatest conservation need are those animals, both aquatic and terrestrial, that are at risk or are declining in Maryland. It is crucial that water quality and hydrology be maintained during all work at this site. We would like to emphasize the need to prevent any sediment or debris from reaching the creek at this location.

The proposed project may be visible from the Youghiogheny River which is a Maryland Scenic and Wild River; further coordination may need to be conducted with DNR as project planning and review continues.

During review for fisheries resources, we have noted the presence of DNR managed land, Swallow Falls State Park and Youghiogheny Wild River NEA, within or adjacent to the project study area. Access and impacts to these lands will have to be directly coordinated with DNR. Projects located on DNR managed land must go through DNR's internal review process. The first step of DNR's internal review process is completing a Project Information Application Form (PIF). Instructions on how to complete the PIF and a blank PIF have been attached to the trilogy app. Please complete the PIF and return it to Chris Homeister at [Christopher.Homeister@Maryland.gov](mailto:Christopher.Homeister@Maryland.gov).

Our analysis of the information provided also suggests that the forested area on or adjacent to the project site contains Forest Interior Dwelling Bird habitat. Populations of many Forest Interior Dwelling Bird Species (FIDS) are declining in Maryland and throughout the eastern United States. The conservation of FIDS habitat is strongly encouraged by the Department of Natural Resources.

#### WHS RESPONSE:

There are several elemental occurrences within the project area which is located within the Lower Deep Creek Complex ESA (Tier 1). In the immediate proximity and therefore of primary concern are two aquatic species residing within groundwater and associated spring emergence area along the south side of Swallow Falls Rd., west of the Youghiogheny River. The main spring which parallels Swallow Falls Road to its confluence with the river supports *Procytola typhlops*, a globally rare (G1G2) state endangered subterranean planarian and a state rare (S2) epigeal planarian, *Planaria dactyligera*. Expansion of the existing road or development of a new approach and associated disturbances on the west side of the Youghiogheny River will likely have a negative impact on these species and if this expansion were to occur south of the existing Swallow Falls Road it would almost certainly cause the extirpation of both planaria species at the site. This area is a wetland of special state concern, however the boundary for this site is poorly depicted in ArcMap and should be reevaluated on site.

In general, all seeps and springs and their catchment basins in the area should also be avoided as several within Swallow Falls State Park and adjacent Garrett State Forest also support the state endangered and globally rare Allegheny spring isopod, *Caecidotea alleghenyensis*. This species entire global range is limited to just a small portion of northwestern Garrett County with Swallow Falls State Park being the epicenter of that distribution.

Any construction along the Youghiogheny River must also be performed with great care as this reach of the river supports the Ocellated damner (*Boyeria grafiana*), a highly rare dragonfly. The state endangered Allegheny hellbender (*Cryptobranchus allegheniensis*) has also been recently detected 5 miles downstream of the project area through eDNA sampling but may occur closer. This species is sensitive to sediment and temperature pollution, particularly during the late summer and fall breeding season.

#### ADDITIONAL COMMENTS ON BMPS:

For projects involving the use of grout, mortar or concrete in or near the stream channel, caution should be used to avoid significant instream pH changes (pH spikes) onsite and downstream; these spikes can potentially be caused by the curing processes of these materials if they come in contact with streamflow while curing. Care should also be taken in design and construction to maintain passage opportunities for aquatic life after project completion.

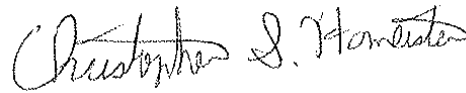
The project should be designed to maintain or enhance fish passage through the project area, particularly during low flow periods.

The project area is adjacent to a mapped Wetland of Special State Concern (WSSC), impacts from the use of heavy equipment, disposal of excavated material, or other construction activities should be avoided to the extent possible. When there is no reasonable alternative to the adverse effects on wetlands or other aquatic or terrestrial habitat, the applicant shall be required to provide measures to mitigate, replace, or minimize the loss of habitat.

Disturbance of the riparian corridor should be minimized to the greatest extent possible. Disturbed areas in the riparian corridor should be revegetated with native forest species to provide habitat and moderate potential temperature impacts. Areas designated for the access of heavy equipment and for the disposal of excavated material should avoid impacts to wetlands and/or mature forest vegetation.

While the expected fish species should be adequately protected by the Use III instream work prohibition period referenced above, sediment and erosion control methods, and other Best Management Practices typically used for prevent runoff and debris from entering surface waters and protecting stream resources; BMPs should be stringently managed and maintained given the potential presence of numerous sensitive species in the watershed.

MD DNR, Environmental Review Program signature



Chris Homeister

DATE: 5/24/2018

## **Appendix D – MHT Historic Sites Response**



February 8, 2018

Charles Nolan  
Greenman-Pedersen, Inc.  
10977 Guilford Road  
Annapolis Junction, MD 20701

Re: Replacement of the Swallow Falls Road Bridge (Bridge No. G-02000)  
Garrett County, Maryland

Dear Mr. Nolan:

Thank you for providing the Maryland Historical Trust (Trust) with information regarding the above-referenced project. According to your project information, the Garrett County Department of Public Works proposes to replace the bridge carrying Swallow Falls Road over the Youghioghenny River. We have reviewed the information in accordance with Section 106 of the National Historic Preservation Act and the Maryland Historical Trust Act of 1985, as appropriate, and we are writing to provide you with our comments.

As noted in your correspondence, the existing bridge was determined ineligible for listing in the National Register of Historic Places in 2001. We believe that the project does not have the potential to affect the historic built environment. The Trust agrees with EAC / Archaeology's recommendation that additional archeological investigation of the project's limits of disturbance is warranted and we look forward to receiving the results of the Phase I survey, when available.

We look forward to working with your agency and all interested parties to successfully complete the preservation requirements for the proposed undertaking. If you have questions or require any assistance, please contact Beth Cole (for archeology) at [beth.cole@maryland.gov](mailto:beth.cole@maryland.gov) or me (for the historic built environment) at [tim.tamburrino@maryland.gov](mailto:tim.tamburrino@maryland.gov).

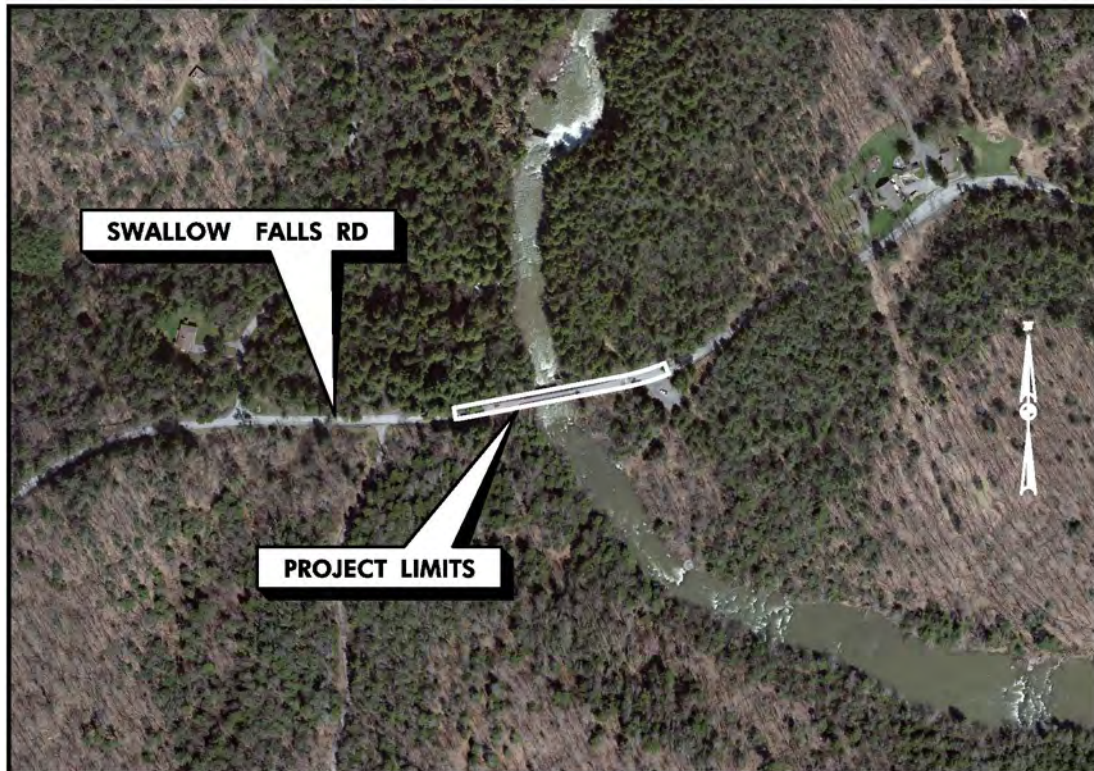
Sincerely,

Tim Tamburrino  
Preservation Officer

TJT 201706857  
Cc: Jane Seiter (EAC / Archaeology, Inc.)

## **Appendix E – 2018 Original Alignment Study**

## Roadway Alignment Study



### Replacement of Bridge No. G-0020 on Swallow Falls Road over the Youghiogheny River

Prepared by



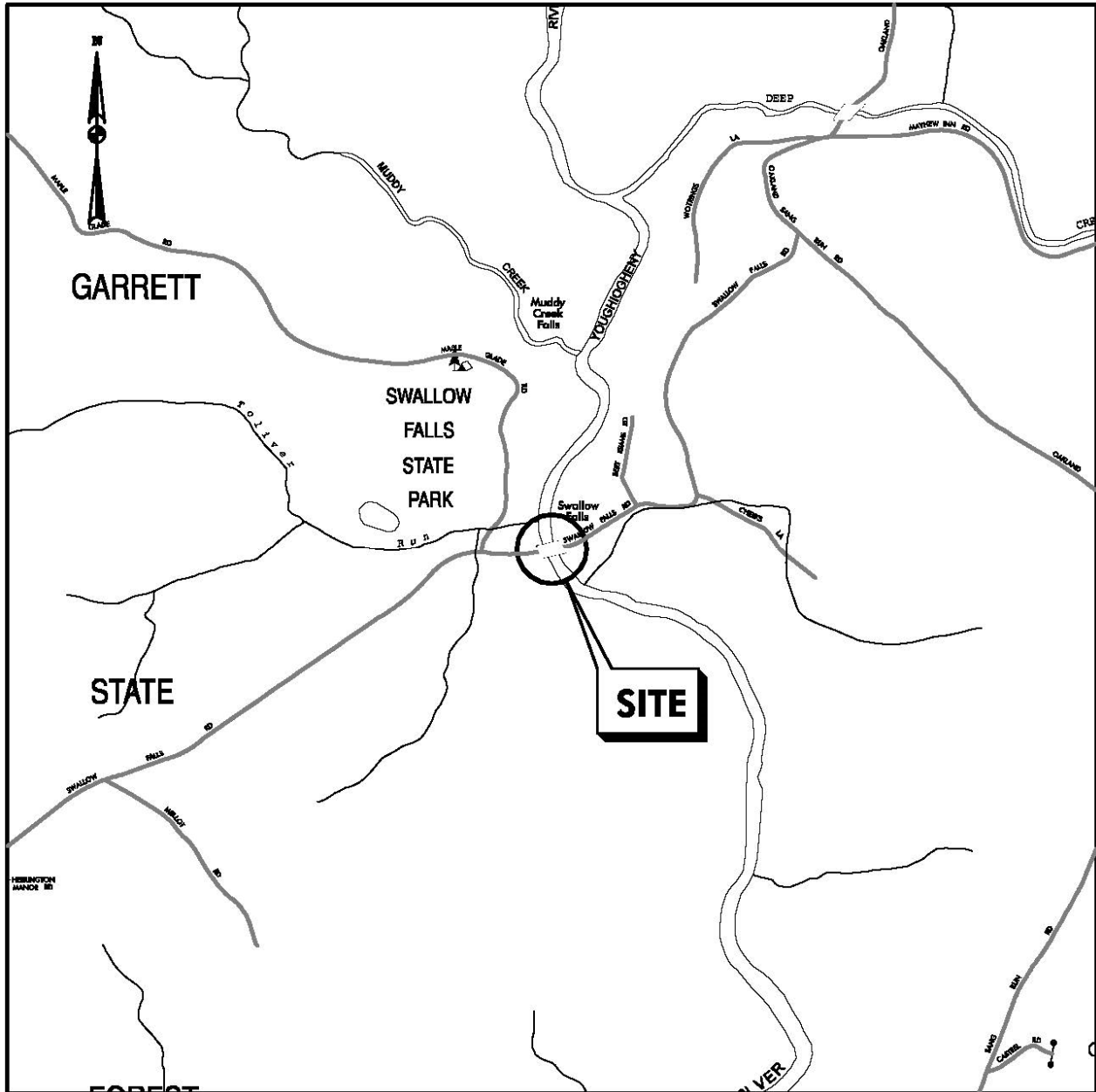
for

Garrett County Government  
Department of Engineering



October 2018





**Replacement of Bridge No. G-0020 on Swallow Falls Road over the Youghiogheny River**

VICINITY MAP

Scale: 1" = 2000'



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**Appendix D: Kepner-Tregoe (K.T.) Analysis**

**I. INTRODUCTION/PROJECT DESCRIPTION**

Garrett County, in cooperation with the MDOT - State Highway Administration, is proposing to replace Bridge No. G-0020 located on Swallow Falls Road over the Youghiogheny River in Garrett County, Maryland (refer to Vicinity Map for location).

Swallow Falls Road is a two lane, undivided open section, normal crowned roadway with a posted speed of 25 mph within the project area. The roadway is described as a local collector. The average daily traffic (ADT), based on information obtained from the bridge inspection report, is 400 vehicles/day (2001) to 465 vehicles/day (2035) with a 5% truck volume. The road is a County maintained roadway that runs in an east-west direction connecting Herrington Manor Road to Oakland Sang Run Road. The roadway consists of a 24-foot (+/-) paved width, allowing for two (2), 10-foot lanes with 2-foot (+/-) shoulders. Right-of-way (County owned), based on GIS information, is limited in the area to just beyond the utility poles and is most likely only a prescriptive right-of-way.

The existing bridge is a two (2) span simply supported steel beam bridge with an overall length of 101'-4" (+/-). The substructure consists of concrete crib wall abutments and a concrete pier. The clear roadway width of the bridge is 20'-0" (+/-). The existing bridge has been closed to traffic but remains in place. A temporary single lane, single span Acrow panel truss structure has been installed spanning above the deck of the existing 2-span bridge. The temporary truss span length is 149'-6" (+/-), center to center of bearings and is supported on temporary concrete stub abutments placed behind the crib wall abutments of the 2-span bridge. The temporary single lane bridge has a clear roadway width of 12'-6" (+/-).

The purpose of this study is to evaluate two (2) potential permanent alignments for the location of the permanent bridge crossing and two (2) potential temporary alignments to be used for maintenance of traffic during the construction.

The two alternative alignment options are:

1. OPTION 1: Maintain the existing permanent bridge centerline with the temporary bridge to the north to maintain traffic.
2. OPTION 2: Shift the permanent bridge centerline to the north and use the existing bridge to maintain traffic.

Included within this study are the descriptions of the two options along with estimates of potential impacts and estimated constructions costs.

Note that GPI has also performed a brief study of the feasibility of using Accelerated Bridge Construction (ABC) techniques that could eliminate the need for a temporary bridge by limiting the length of the roadway closure. A summary of the ABC study is included in Section VIII of this report. Preliminary comparative cost estimates for ABC options are included in the Cost Estimates section of this report. The ABC options are also included for comparison purposes in the Kepner-Tregoe Analysis (K.T. Analysis) that is presented in Appendix D. The ABC Options assume that the replacement bridge will be set along the existing alignment, similar to alignment Option 1 noted above, but with no temporary bridge construction.

**II. ALTERNATIVE ALIGNMENT OPTIONS**

OPTION 1: Option 1 will maintain the present roadway centerline alignment. The proposed bridge structure will be located along the existing centerline. The existing single span Acrow panel truss structure will be removed and relocated to the north of the existing bridge using a temporary roadway shift to allow Swallow Falls Road to remain open to traffic during the construction of the new bridge.

The permanent baseline of construction alignment will follow the existing Swallow Falls Road centerline as much as possible with a design speed of 30 mph. A 30 mph minimum design speed would meet AASHTO requirements for the minimum design speed for a rural collector (AASHTO Table 6-1). The grade across the permanent bridge will be -1.00% with -6.36% approach grade and +4.34% exit grade. The low point of the roadway will be located off the bridge structure. The proposed vertical alignment will tie to the existing roadway approximately 280' to the west and 315' to the east of the existing bridge.

The permanent roadway typical section will consist of 2-10' wide travel lanes with a 2% normal crown cross slope, 5' wide paved shoulder area at a 6% cross slope and a 6' wide roadside (safety) graded area at a 6:1 slope. Beyond this 6' area a 2:1 slope will be provided to incorporate a roadside cut ditch or fill slope. A 5' wide sidewalk area will be provided across the north side of the bridge section. Along the west side approach, the sidewalk will transition, at a 12:1 slope, from the roadway section to the bridge section. Beyond the bridge, on the east side, the sidewalk will be constructed adjacent to the 5' shoulder, at a 2% cross slope and continue to the entrance to the existing hiking foot trail that parallels the east side of the Youghiogheny River. A 5-foot wide shoulder will provide bicycle compatibility across the bridge, meeting MDOT-SHA requirements for a 4-foot minimum shoulder with an additional 1-foot offset where the shoulder is abutting a curb and/or traffic barrier.

For this study, the existing crib wall bridge abutments of the existing 2-span bridge are assumed to remain in place to serve as the lateral earth support for the new abutments and the new abutments for the replacement bridge would be placed behind the existing crib walls. This will also have the benefit of limiting the required encroachment into the stream for the new construction. The proposed bridge is assumed to be a single span structure and the existing pier in the stream would be removed.

In order to maintain traffic on Swallow Falls Road during construction of the proposed bridge a temporary roadway is proposed to the north of the existing bridge. In order to provide this temporary roadway, the existing 12.5' wide Acrow panel truss structure will be removed from its present location and moved to the north where it will be placed on temporary abutments. The temporarily shifted roadway alignment will be designed using a 15 mph design speed to limit impacts to adjacent property. The proposed temporary vertical alignment will tie to the existing roadway approximately 410' to the west and 425' to the east of the existing bridge.

The temporary roadway typical section will consist of 2-12' wide travel lanes with a 2% cross slope. Beyond the travel lane a 6' wide roadside (safety) graded area at a 6:1 slope will be used along the left side of the roadway for installation of traffic barrier as required. Beyond this 6' wide area, a 2:1 slope will be provided. Along the right side of the roadway, adjacent to the travel lane, a 6:1 slope will be used to tie into the permanent grades of the proposed roadway.

As the existing Acrow panel bridge (12'-6" travel lane width) will only permit a single lane of traffic flow, an alternating two-way traffic movement will be required as currently exists at the present bridge location. In order for motorists to safely negotiate oncoming vehicles, a buffer length of 85-feet will be provided at each approach of the bridge. This length is based on 15 mph stopping sight distance and will allow motorists ample time to stop and allow oncoming vehicles to cross the bridge.

Option 1 will require a short duration roadway closure in order to move the existing Acrow panel truss bridge to the north. It is assumed that the construction of temporary abutments and temporary roadway pavement can be completed prior to relocation of the Acrow truss bridge in order to minimize the required roadway closure period. Once construction of the new bridge is completed, the temporary bridge along with the temporary roadway pavement and embankments will be removed.

Exhibits for the Option 1 Roadway Plan (showing estimated limits of grading and disturbance) with typical sections and profiles for the Permanent Bridge Alignment and Temporary Roadway Shift are contained in Appendix A of this study.

OPTION 2: Option 2 will shift the permanent roadway and bridge alignment approximately 35-feet to the north of the existing bridge location. The existing single span Acrow panel truss structure will remain in place along with the existing roadway to allow Swallow Falls Road to remain open to traffic during the construction of the new bridge.

The baseline of construction alignment will essentially parallel the existing Swallow Falls Road centerline. A design speed of 25 mph has been used in this study to help limit impacts from the project based on practical design considerations, which allow for design speeds to be set at the actual posted speed. A design exemption may be required for the 25 mph design speed. The grade across the permanent bridge will be -1.00% with -8.48% approach grade and +5.64% exit grade. The low point of the roadway will be located off the bridge structure. The proposed vertical alignment will tie to the existing roadway approximately 585' to the west and 425' to the east of the existing bridge.

The permanent roadway typical section will consist of 2-10' wide travel lanes with a 2% normal crown cross slope, 5' wide paved shoulder area at a 6% cross slope and a 6' wide roadside (safety) graded area at a 6:1 slope. Beyond this 6' area a 2:1 slope will be provided to incorporate a roadside cut ditch or fill slope. A 5' wide sidewalk area will be provided across the north side of the bridge section. Along the west side approach, the sidewalk will transition, at a 12:1 slope, from the roadway section to the bridge section. Beyond the bridge, on the east side, the sidewalk will be constructed adjacent to the 5' shoulder, at a 2% cross slope and continue to the entrance to the existing hiking foot trail that parallels the east side of the Youghiogheny River.

The new bridge is assumed to be a single span bridge with a clear span between abutments closely matching the distance between abutments of the existing 2-span bridge. This should ensure no adverse impacts to the 100-year floodplain.

Once construction of the new bridge is completed, the existing Acrow panel bridge and the existing 2-span bridge, along with the portion of the existing roadway to the tie-in locations at each approach, will be removed.

Exhibits for the Option 2 Roadway Plan (showing estimated limits of grading and disturbance) with typical sections and the profile for the Permanent Bridge Alignment are contained in Appendix B of this study.

### III. STORMWATER MANAGEMENT/EROSION AND SEDIMENT CONTROL

A preliminary stormwater management (SWM), environmental site design (ESD) analysis was developed for the alignment options based on increases in impervious area and reconstruction of existing impervious area. Review and approval of SWM will be through the Garrett County Permits & Inspections, Stormwater Management Section. Facilities would be required to provide environmental site design volume (ESDv) and channel protection volume (CPv), unless waivers and/or variances are approved for the project. Possible options for treatment are the installations of bio-swales and/or micro-bioretenion facilities. Below is a summary of the estimated treatment requirements for the two options:

Impervious Area Requiring Treatment (IART):

#### OPTION 1:

- 1. New impervious area.....8,300 S.F.
  - 2. Reconstructed impervious area.....14,500 S.F.
  - 3. Existing impervious area removed.....4,230 S.F. (\*)
  - 4. Net impervious area requiring treatment (IART): (1)+(2)-(3).....18,570 S.F.
- (\*)-Existing parking area pavement to be removed and replaced by reinforced turf section

#### OPTION 2:

- 1. New impervious area.....26,520 S.F.
  - 2. Reconstructed impervious area.....4,520 S.F.
  - 3. Existing impervious area removed.....20,530 S.F. (\*)
  - 4. Net impervious area requiring treatment (IART): (1)+(2)-(3).....15,510 S.F.
- (\*)-Includes existing parking area pavement to be removed and replaced by reinforced turf section

The ESDv (C.F.) required for the project is based on the formula:

$$ESDv = (Pe \times Rv \times A) / 12$$

Where:

Pe = Rainfall Target for the project based on the hydrologic soil group and % Impervious (Pe = 2.6" based on 100% impervious)

Rv = 0.05 + (0.009I) where I is taken as 100% impervious

A = Amount of impervious area requiring treatment (IART) (S.F.)

ESDv required: (Based on use of micro-bioretenion facility to store 75% of ESDv)

OPTION 1: 2,867 C.F.

OPTION 2: 2,394 C.F.

Preliminary options for potential SWM facilities are noted on the Option 1 and Option 2 plans, based on the estimated ESDv required volumes. These facilities shown are for rough estimating purposes only to allow for comparison of the options and estimation of potential impacts from the construction of SWM facilities.

The steep grades in the project area make it difficult to construct bioswales, which are limited to a maximum grade of 4 percent. Bioretention facilities and the possibility of using pervious pavement within the existing parking area are assumed for the purposes of this study to compare the alignment options. For alignment Option 1, SWM facility construction would require extensive clearing, grubbing and grading outside of current roadway right-of-way, resulting in additional impacts to forested areas, significant trees and wetland areas. For alignment Option 2, SWM facilities could be placed within the existing roadway right-of-way after the permanent roadway is shifted to the north.

The potential environmental and right-of-way impacts from the construction of SWM facilities may be a consideration in the evaluation of the use of waivers and/or variances for SWM. The benefits of SWM may be offset by the additional impacts to the environment, including forest clearing, removal of specimen trees and wetland impacts, as well as the additional right-of-way needs. Also, as shown, some of the grading for the SWM facilities for Option 1 extends outside of the studied Area of Potential Effect (APE) of the archaeological investigation. Further refinement of the SWM design will be needed to confirm if additional historical/archeological investigation will be necessary. For the purposes of this study and comparison of alternatives, it has been assumed that SWM facilities will be required. To allow for consideration of potential waivers and/or variances for SWM, the impacts on utilities, forests, specimen trees and wetlands from the SWM facility construction for alignment Option 1 are noted.

A sediment and erosion control plan will be required for this project. All sediment and erosion control measures will be designed in accordance with the *2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control*. All submittals will be made to the Garrett County Soil Conservation District for review and approval.

#### IV. UTILITIES

There are numerous utility poles located within the project area. Along the north side of the site overhead communication lines are present. These lines cross over to the south approximately 140' west of the existing bridge and then run parallel along the eastbound roadway. Overhead electric lines are present along the south side of the site. The lines run from the pole located at the rear of the existing parking area and then run to the west, paralleling eastbound Swallow Falls Road. Both options will require relocation of both the electric and communication overhead utilities. Listed below are the estimated number of utility poles impacted by the options:

OPTION 1:           7 Poles  
OPTION 2:           4 Poles

#### V. RIGHT OF WAY

Existing County road right-of-way is limited in the area and may be only a prescriptive right-of-way (ROW). Based on GIS information the existing ROW width appears to be 45-feet. Within

the project area, adjacent property is under the ownership of the Maryland Department of Forests and Parks and the Maryland Department of Natural Resources. The estimated right-of-way/easement acquisition areas are as follows:

OPTION 1:

Fee Simple Right-of-Way area:	0.161 Acres
Easements (drainage and temporary construction):	0.984 Acres
SWM Facility Easement area:	0.554 Acres*

OPTION 2:

Fee Simple Right-of-Way area:	0.717 Acres
Easements (drainage and temporary construction):	0.616 Acres
SWM Facility Easement area:	0.087 Acres*

(\*assumes 0.087 Acres for conversion of parking lot to pervious material)

It should be noted that impacts beyond the existing right-of-way and into the Swallow Falls Park property, as noted on the plans as “MD STATE DEPT. FORESTS AND PARKS, L. 00194, F. 0213”, will have to be coordinated with DNR and the National Park Service (NPS) because the park was purchased with Land and Water Conservation Funds (LWCF). If the LWCF right-of-way is permanently converted, then the County will have to provide land to the Parks that is of the same financial and ecological value (preferably adjacent to the existing parkland). The Parks considers land conversion to occur after six months of restricted use by the Parks. If it takes more than six months to build the bridge and the LWCF area is being used for six months or more, then land transfer would be required, even if the use for construction is temporary. For Option 1, no LWCF fund property is impacted. For Option 2, 0.09 acres will be impacted. Approximately 0.02 acres of fee simple right-of-way would be required within the LWCF property, but the remaining 0.07 acres would be temporary easements. With proper construction sequencing, the use of the temporary easement areas required within the LWCF property could be limited to less than 6 months in duration.

## VI. ENVIRONMENTAL

Forested Areas: There are forested areas present along both sides of Swallow Falls Road that are part of Swallow Falls State Park. These forested areas will be impacted by both options. The estimated impacts to forested areas are as follows:

OPTION 1:	1.55 Acres (Approximately 0.51 acres of these impacts are due to SWMF construction)
OPTION 2:	1.07 Acres

Specimen Trees: Specimen trees are present within the project area that will be impacted by both options. The estimated number of specimen trees impacted are as follows:

OPTION 1:	7 Trees (Approximately 5 trees are impacted due to SWMF construction)
OPTION 2:	3 Trees



Waters of the US (WUS): Within the project area the existing bridge crosses over the Youghiogheny River which is classified as Water of the US (WUS). There will be temporary WUS impacts resulting from the maintenance of stream flow operation. For this study, temporary WUS impacts for Option 2 will be more extensive than for Option 1 in order to construct the permanent bridge abutments near the water's edge. Permanent WUS impacts are not anticipated or will be minimal.

Wetlands: Emergent wetlands and the associated buffer area is present within the project area. These areas will be impacted by both options. The estimated impacts are as follows:

**OPTION 1:**

Wetland area: 3,870 S.F.  
(Approx. 2,880 S.F. of impacts are due to SWMF construction)  
Wetland Buffer area: 6,300 S.F.  
(Approx. 2,880 S.F. of impacts are due to SWMF construction)

**OPTION 2:**

Wetland area: 558 S.F.  
Wetland Buffer area: 1,350 S.F.

100 Year Floodplain: Based on FEMA mapping there is a 100-year floodplain associated with the Youghiogheny River at the crossing area. Based on preliminary profile and bridge design, the height of the water surface will be well below the proposed bridge and the bridge reconstruction should not have any adverse impact on the 100-year floodplain.

## **VII. HISTORICAL/ARCHEOLOGIC RESOURCES**

EAC Archaeology, Inc. has completed a preliminary Phase I Archeological Survey of the project area. Based on their findings, the site is recommended as not eligible for listing on the National Register of Historic Places. No new archaeological sites were identified during the current survey. The existing Swallow Falls Road Bridge (Garrett County Bridge No. G-02000) was previously determined not to be eligible for the National Register of Historic Places (MHT 2011). The Survey notes that further archaeological work within the estimated Area of Potential Effect (APE) for the Swallow Falls Road Bridge Replacement Project is not recommended. Should the final LOD extend beyond the APE studied, some additional investigation may be required to confirm the findings.

## **VIII. ACCELERATED BRIDGE CONSTRUCTION (ABC) CONSIDERATIONS**

The proposed bridge is assumed to be a single span bridge with abutments set behind the existing crib wall abutments. This will avoid the need to construct piers in the water and will allow the existing abutments to be used as part of the maintenance of stream flow for construction of the new abutments. The new bridge will not be able to reuse the existing pier due to its condition and the existing crib wall abutments would not be able to handle the additional loading associated with a single span bridge.

As previously mentioned, ABC techniques were only considered for alignment Option 1 to eliminate the need for a temporary bridge and temporary roadway to the north and, therefore, minimize impacts to the adjacent parks. Option 1b and Option 1c assume that ABC techniques are utilized whereas Option 1 and Option 2 assume conventional construction techniques. For any of the options, girder installation will be affected by the following factors:

- Relatively remote location of the site
- Weight of girder picks due to single span length
- Crane size needed to accommodate girder picks
- Assumption that a crane may not be situated on a causeway in the river

All of the following ABC options assume the use of precast abutments. The foundation requirements will be determined later once additional geotechnical information is available. Depending on the recommended foundation type, it may be feasible to accelerate any of the following options by installing some, or all, of the foundation prior to the closure period.

OPTION 1B: Option 1b assumes the utilization of “Slide-In Bridge Construction” (SIBC). The proposed superstructure would be built parallel to the existing bridge in approximately the same location where the proposed temporary bridge is shown for Option 1. Site work would need to be performed on both sides of the bridge to accommodate temporary abutments and equipment access.

For this option, the girders could be lifted from a trailer, sitting on the existing bridge, to the temporary abutments which would minimize crane size. This operation could be carried out under either a series of short-term closures (30-60 minutes) or a longer weekend closure. Conventional construction techniques can then be utilized to complete the bridge deck and barriers prior to the slide-in being performed without any additional traffic closures. Once the superstructure is completed in the temporary location, a longer-term detour (approximately 1 month) would be required to complete the following activities:

- Demolish the existing bridge
- Install foundations for the permanent abutments
- Set and grout precast abutment components
- Perform lateral slide of new superstructure
- Complete approach tie-ins and open road

The use of Prefabricated Bridge Elements and Systems (PBES) was also considered but determined to be less desirable. This technology utilizes modular sections of girder pairs with an 8-foot width of precast bridge deck. Ultra High-Performance Concrete (UHPC) closure pours are used to complete the superstructure under a closure duration of approximately 2 months. However, the modular sections would weigh in excess of 160 kips and may be difficult to deliver to the site. Their installation may require launching due to the relative lack of crane placement locations.

This alternative is practical for longer, multi-span bridges, but is less desirable at this location since it adds closure duration without significantly reducing cost. The SIBC option would also foster a more durable superstructure since it will be less reliant on contractor expertise than any option that utilizes UHPC.

Due to the elimination of the need for the temporary roadway, ABC Option 1b would facilitate a minor reduction in impacts to the adjacent property. Constructing the new bridge superstructure in its entirety adjacent to the proposed bridge will require some site work to facilitate access to construct the temporary abutments/supports for the superstructure until it can be placed into the permanent location. It is estimated that impacts to forested areas, specimen trees and right-of-way all could be reduced by utilizing slide-in construction.

OPTION 1C: Option 1c assumes the existing roadway will be closed for the duration of all construction activities. Similar to Option 1b, the demolition of the existing bridge would be followed by the installation of foundations and precast abutment components. A steel girder superstructure could then be installed with the concrete deck placed using stay-in-place (SIP) deck forms per conventional techniques. The road could be re-opened to single lane of two-way traffic once the deck is completed and the sidewalk and barriers could then be constructed adjacent to the single lane of live traffic without further need for a detour. This work could be completed under a detour duration of approximately 3 months at a lower cost than the preceding ABC options. The remaining construction of the bridge sidewalk and parapets, as well as remaining roadway work, could be completed while maintaining the one lane of two-way traffic across the bridge.

This option could be further accelerated by utilizing precast deck panels in lieu of a cast-in-place concrete deck. This technology could save approximately 1 month in closure duration for a trade-off of additional cost, risk of delay, and a potentially less durable new structure.

The construction of the new bridge along the existing alignment with no adjacent temporary bridge or roadway construction keeps the impacts to a minimum. By eliminating the temporary roadway, ABC Option 1c would result in considerably fewer impacts to adjacent property which would limit impacts to forested areas, specimen trees, and right-of-way.

**IX. COST ESTIMATES**

The associated construction costs for alignment Options 1 and 2, as well as for ABC Options 1b and 1c noted herein, are summarized below. Detailed estimates for each option are provided within Appendix C for reference.

OPTION	ESTIMATED CONSTRUCTION COST INCLUDING CONTINGENCY*
OPTION 1	\$5,114,300
OPTION 2	\$4,699,700
ABC OPTION 1B	\$5,182,400
ABC OPTION 1C	\$4,736,800

\* Right-of-way cost not included

**X. ANALYSIS AND SUMMARY**

Provided that a detour duration of approximately 3 months is acceptable, the preliminary analysis indicates that ABC Option 1c be pursued to limit the impacts to valuable natural resources and reduce costs.

A Kepner-Tregoe (K.T.) Analysis was developed to compare the pros and cons of each option using a quantitative approach and is presented in Appendix D of this report. Specific criteria are compared for each option using a weighted scoring process. Each option is given a score for each subjective criterion with the option that best satisfies the specific criteria given a score of ten (10). The remaining scores are developed subjectively based on how each option satisfies the criteria when compared to the other options. The criteria are also each provided a weight to reflect the importance of the specific criteria on the evaluation of the options. Based on the weights and scores used in the K.T. Analysis, ABC Option 1c rates as the highest value alternative.



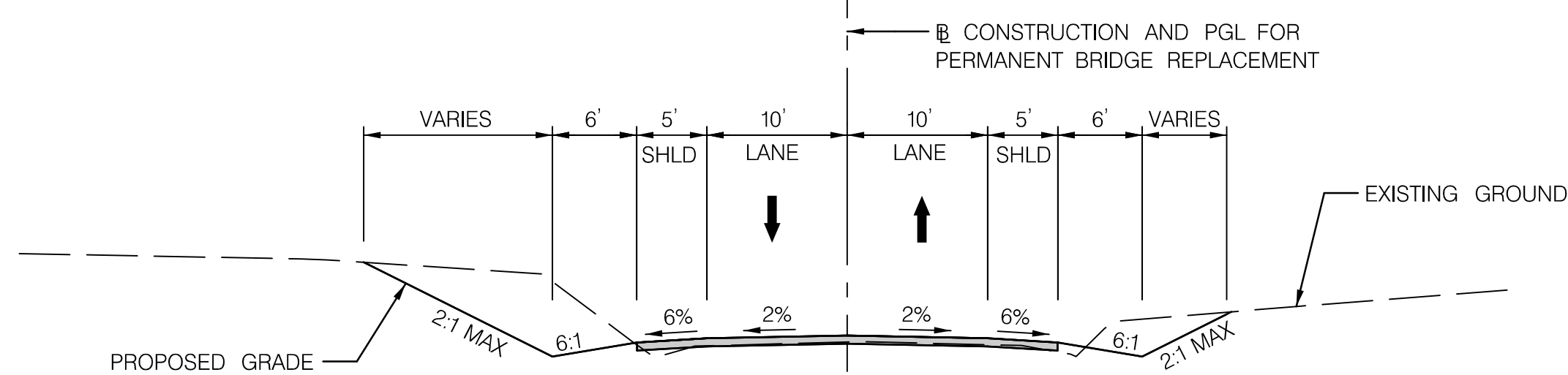
***APPENDIX A***

**OPTION 1 - MAINTAIN EXISTING PERMANENT BRIDGE CENTERLINE WITH TEMPORARY BRIDGE TO THE NORTH**

• 30 MPH DESIGN SPEED ROADWAY ALIGNMENT TO MATCH EXISTING CENTER LINE OF SWALLOW FALLS ROAD.

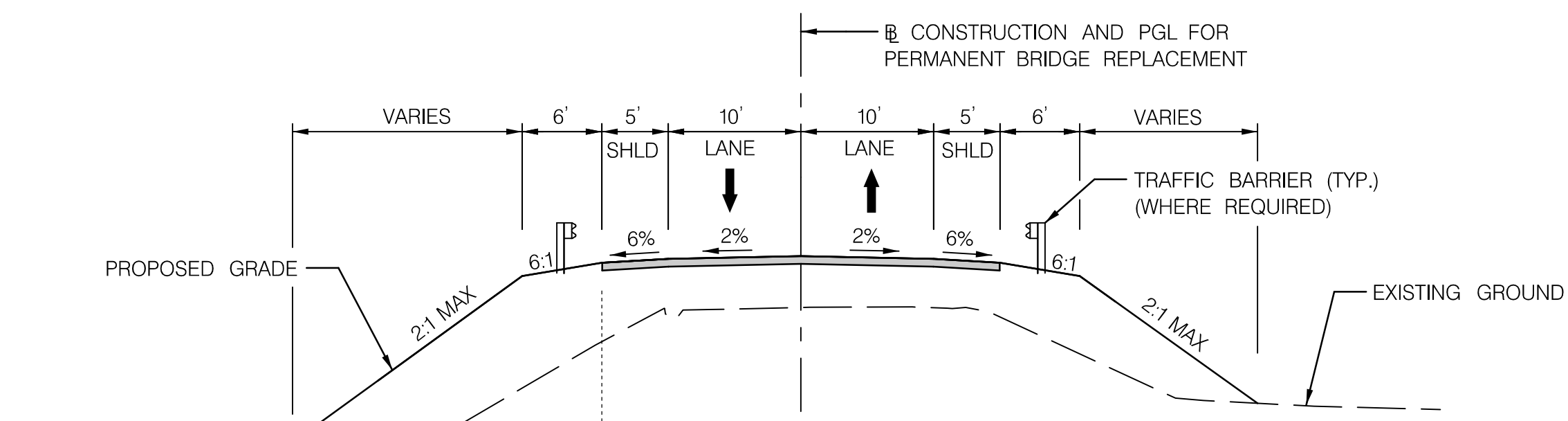
• EXISTING SINGLE SPAN ACROW PANEL TRUSS STRUCTURE TO BE RELOCATED TO THE NORTH SIDE OF THE EXISTING BRIDGE USING A TEMPORARY ROADWAY SHIFT BASED ON A 15 MPH DESIGN SPEED TO ALLOW SWALLOW FALLS ROAD TO REMAIN OPEN TO TRAFFIC DURING CONSTRUCTION OF A NEW BRIDGE.

NOTE: 1. EXISTING UTILITY POLE TO BE REMOVED/RELOCATED.  
2. EXISTING PARKING AREA PAVEMENT TO BE REMOVED AND REPLACED WITH REINFORCED TURF SECTION OR PERVIOUS PAVEMENT TO HELP OFFSET SWM REQUIREMENTS.



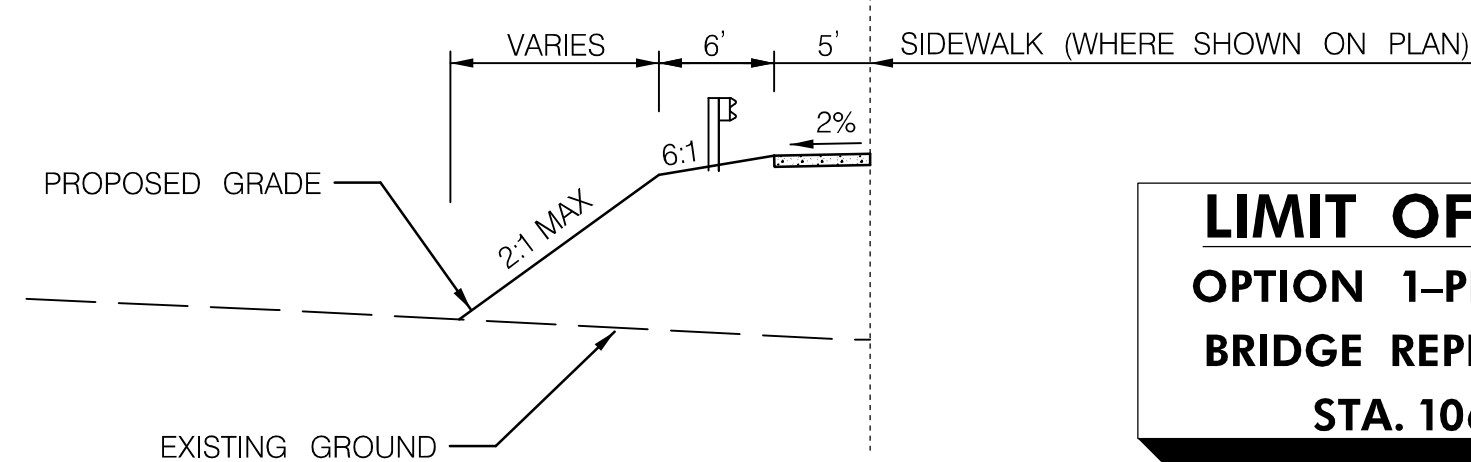
PERMANENT ROADWAY TYPICAL SECTION (CUT)

SCALE: 1" = 10"



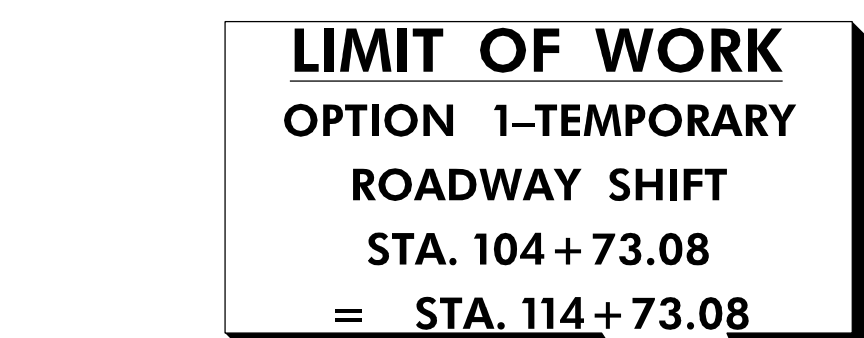
PERMANENT ROADWAY TYPICAL SECTION (FILL)

SCALE: 1" = 10"



TYPICAL SECTION TEMPORARY ROADWAY (FILL)

SCALE: 1" = 10"



TYPICAL SECTION TEMPORARY ROADWAY (CUT)

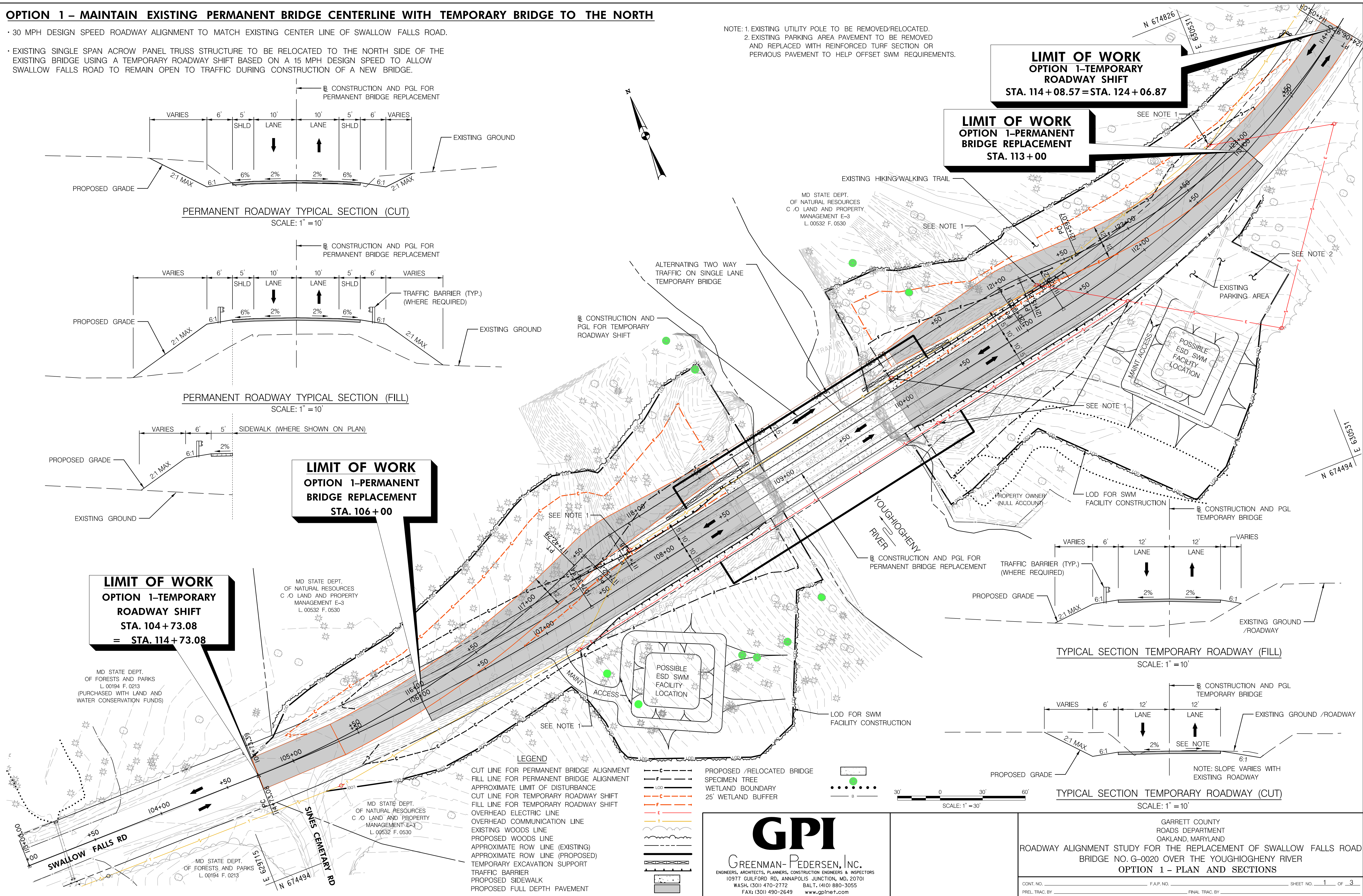
SCALE: 1" = 10"

**LIMIT OF WORK  
OPTION 1-PERMANENT  
BRIDGE REPLACEMENT  
STA. 106+00**

**LIMIT OF WORK  
OPTION 1-TEMPORARY  
ROADWAY SHIFT  
STA. 104+73.08  
= STA. 114+73.08**

**LIMIT OF WORK  
OPTION 1-TEMPORARY  
ROADWAY SHIFT  
STA. 114+08.57 = STA. 124+06.87**

**LIMIT OF WORK  
OPTION 1-PERMANENT  
BRIDGE REPLACEMENT  
STA. 113+00**



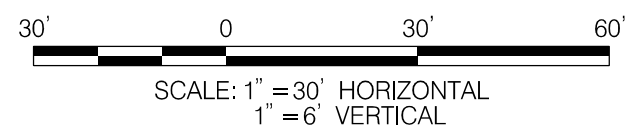
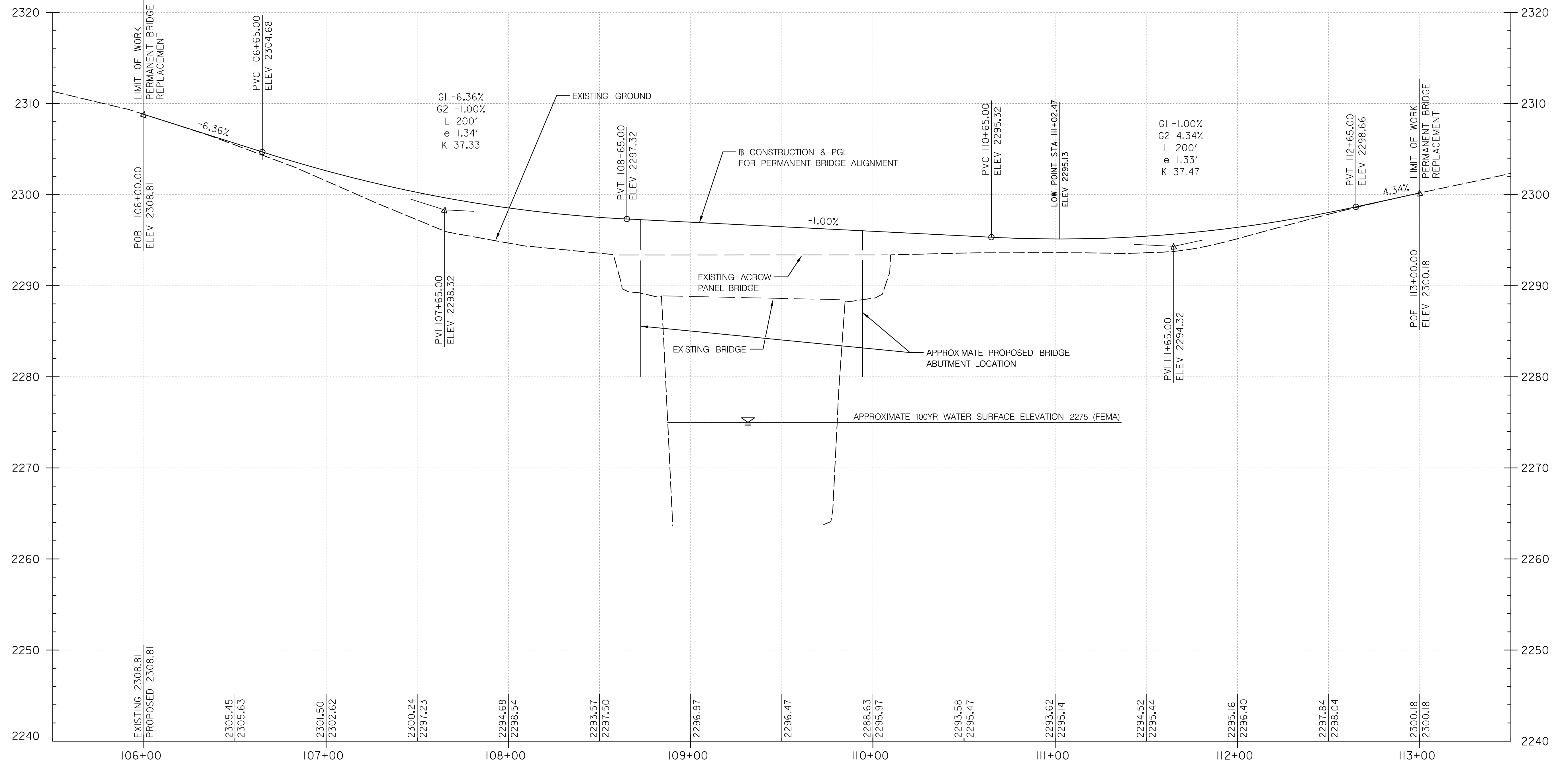
- LEGEND**
- C- PROPOSED /RELOCATED BRIDGE
  - F- FILL LINE FOR PERMANENT BRIDGE ALIGNMENT
  - LOC- APPROXIMATE LIMIT OF DISTURBANCE
  - C- CUT LINE FOR PERMANENT BRIDGE ALIGNMENT
  - C- CUT LINE FOR TEMPORARY ROADWAY SHIFT
  - F- FILL LINE FOR TEMPORARY ROADWAY SHIFT
  - E- OVERHEAD ELECTRIC LINE
  - E- OVERHEAD COMMUNICATION LINE
  - W- EXISTING WOODS LINE
  - W- PROPOSED WOODS LINE
  - R- APPROXIMATE ROW LINE (EXISTING)
  - R- APPROXIMATE ROW LINE (PROPOSED)
  - T- TEMPORARY EXCAVATION SUPPORT
  - T- TRAFFIC BARRIER
  - S- PROPOSED SIDEWALK
  - P- PROPOSED FULL DEPTH PAVEMENT
  - S- SPECIMEN TREE
  - W- WETLAND BOUNDARY
  - B- 25' WETLAND BUFFER

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GARRETT COUNTY  
ROADS DEPARTMENT  
OAKLAND, MARYLAND  
ROADWAY ALIGNMENT STUDY FOR THE REPLACEMENT OF SWALLOW FALLS ROAD  
BRIDGE NO. G-0020 OVER THE YOUGHIOGHENY RIVER  
OPTION 1 - PLAN AND SECTIONS

CONT. NO. \_\_\_\_\_ F.A.P. NO. \_\_\_\_\_ SHEET NO. 1 OF 3  
PREL. TRAC. BY \_\_\_\_\_ FINAL TRAC. BY \_\_\_\_\_

PLOTTED: Tuesday, October 09, 2018 AT 03:28 PM  
 FILE: N:\000000000\2-2018 SWA\_Swallow Falls Bridge Design\Drawings\Task 24\_Swallow Falls Bridge\CAD\Drawings\Study\Plan\PC-PROC\_Swallow Falls.dwg



**OPTION 1 - PERMANENT BRIDGE ALIGNMENT**

30 MPH DESIGN SPEED ROADWAY PROFILE ALONG THE EXISTING CENTER LINE OF SWALLOW FALLS ROAD FOR PERMANENT BRIDGE REPLACEMENT

PLOTTED: Tuesday, September 18, 2018 AT 10:03 PM  
 FILE: N:\2018\09\18\180918\_01\_2018\_SHA\_Swallow\_Bridge\_Design\_Solutions\Task 34\_Swallow\_Bridge\_GADP\Drawings\Study\_Profile\Profile\Profile.dwg

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GARRETT COUNTY  
 ROADS DEPARTMENT  
 OAKLAND, MARYLAND  
 ROADWAY ALIGNMENT STUDY FOR THE REPLACEMENT OF SWALLOW FALLS ROAD  
 BRIDGE NO. G-0020 OVER THE YOUGHIOGHENY RIVER  
**OPTION 1 - PROFILE, PERMANENT ROADWAY**

CONT. NO. \_\_\_\_\_ F.A.P. NO. \_\_\_\_\_ SHEET NO. 2 OF 3  
 PREL. TRAC. BY \_\_\_\_\_ FINAL TRAC. BY \_\_\_\_\_



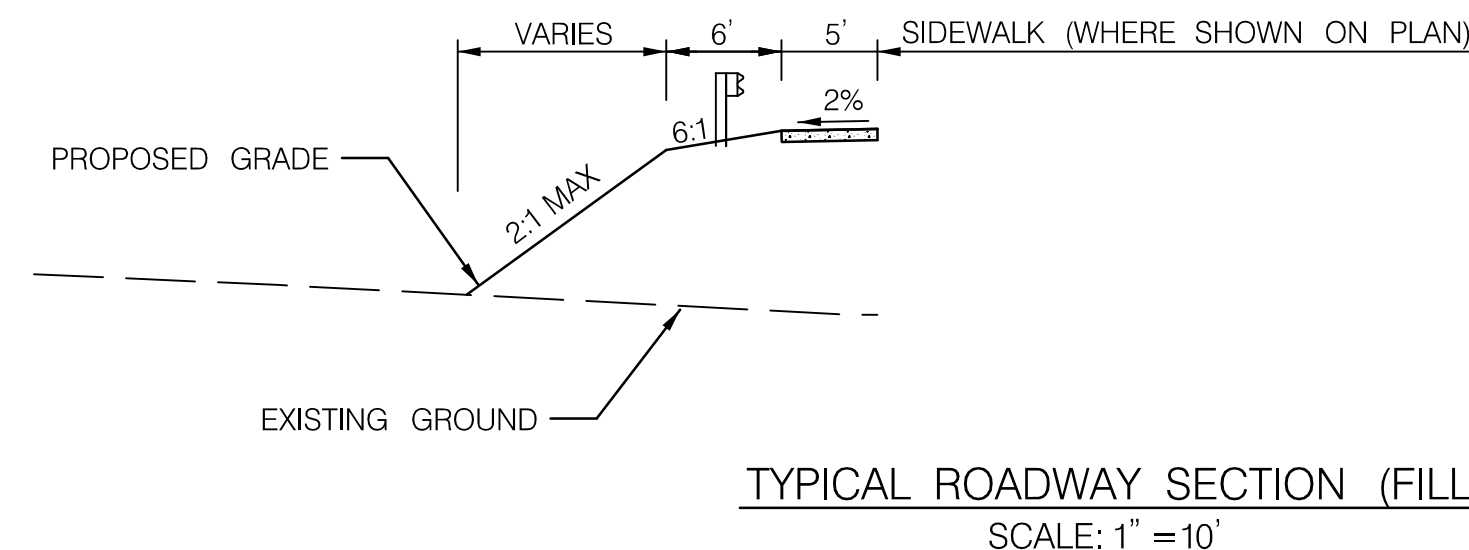
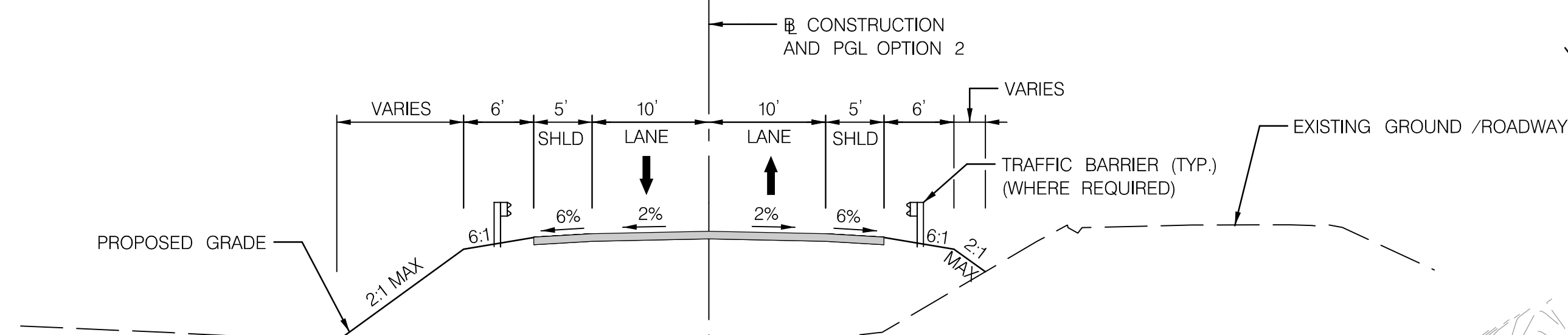
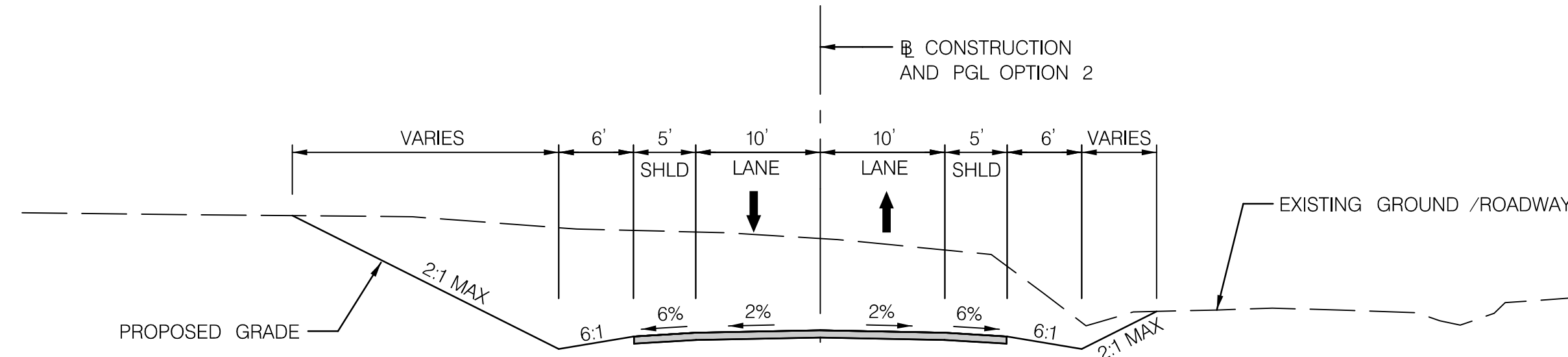




***APPENDIX B***

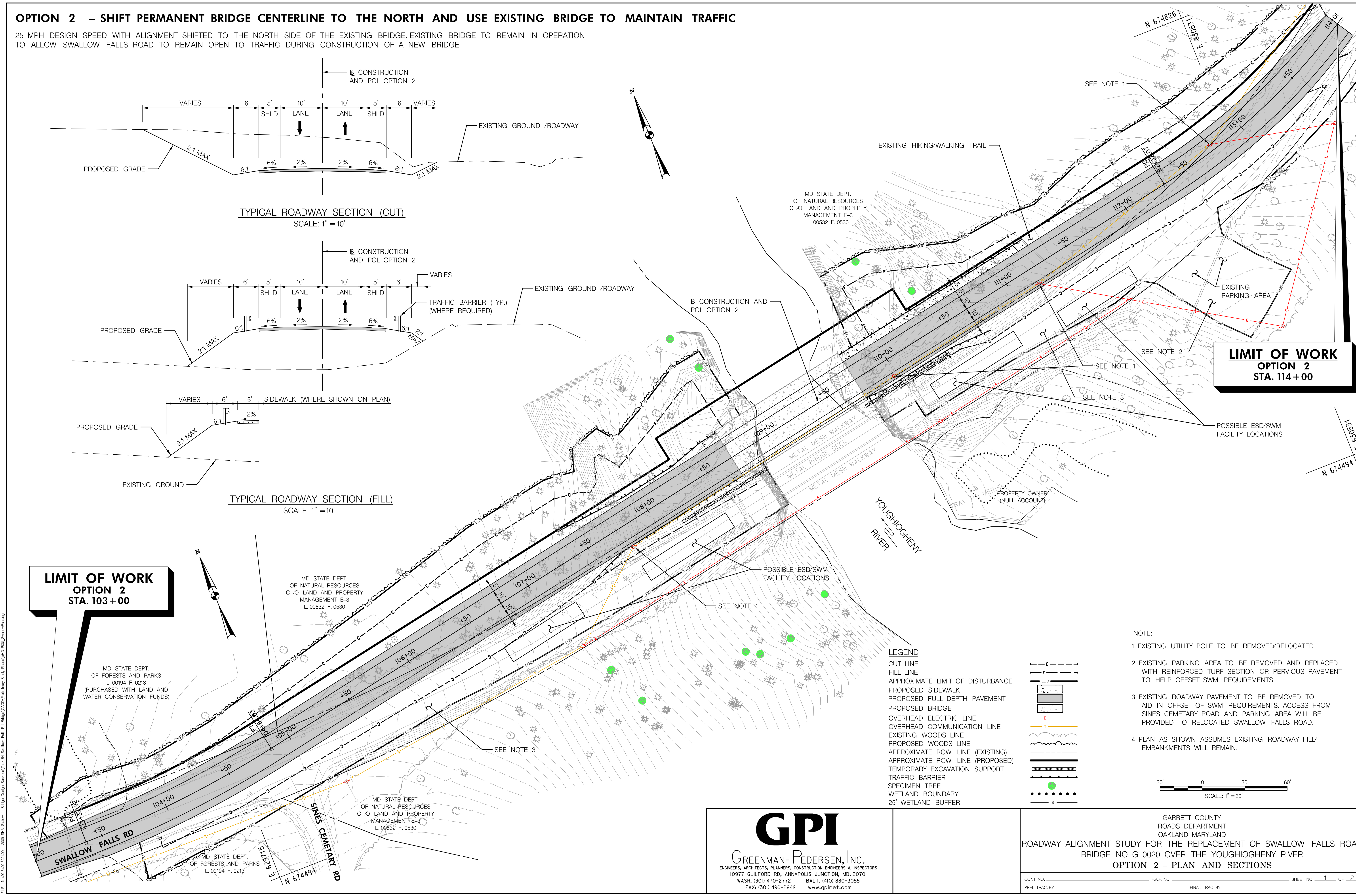
**OPTION 2 - SHIFT PERMANENT BRIDGE CENTERLINE TO THE NORTH AND USE EXISTING BRIDGE TO MAINTAIN TRAFFIC**

25 MPH DESIGN SPEED WITH ALIGNMENT SHIFTED TO THE NORTH SIDE OF THE EXISTING BRIDGE. EXISTING BRIDGE TO REMAIN IN OPERATION TO ALLOW SWALLOW FALLS ROAD TO REMAIN OPEN TO TRAFFIC DURING CONSTRUCTION OF A NEW BRIDGE



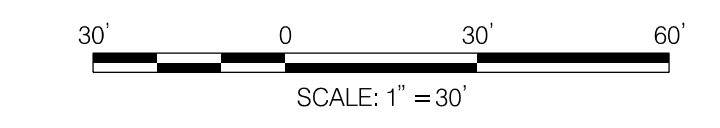
**LIMIT OF WORK  
OPTION 2  
STA. 103+00**

**LIMIT OF WORK  
OPTION 2  
STA. 114+00**



- LEGEND**
- - - CUT LINE
  - F — FILL LINE
  - - - - - APPROXIMATE LIMIT OF DISTURBANCE
  - - - - - PROPOSED SIDEWALK
  - - - - - PROPOSED FULL DEPTH PAVEMENT
  - - - - - PROPOSED BRIDGE
  - - - - - OVERHEAD ELECTRIC LINE
  - - - - - OVERHEAD COMMUNICATION LINE
  - - - - - EXISTING WOODS LINE
  - - - - - PROPOSED WOODS LINE
  - - - - - APPROXIMATE ROW LINE (EXISTING)
  - - - - - APPROXIMATE ROW LINE (PROPOSED)
  - - - - - TEMPORARY EXCAVATION SUPPORT
  - - - - - TRAFFIC BARRIER
  - - - - - SPECIMEN TREE
  - - - - - WETLAND BOUNDARY
  - - - - - 25' WETLAND BUFFER

- NOTE:**
1. EXISTING UTILITY POLE TO BE REMOVED/RELOCATED.
  2. EXISTING PARKING AREA TO BE REMOVED AND REPLACED WITH REINFORCED TURF SECTION OR PERVIOUS PAVEMENT TO HELP OFFSET SWM REQUIREMENTS.
  3. EXISTING ROADWAY PAVEMENT TO BE REMOVED TO AID IN OFFSET OF SWM REQUIREMENTS. ACCESS FROM SINES CEMETARY ROAD AND PARKING AREA WILL BE PROVIDED TO RELOCATED SWALLOW FALLS ROAD.
  4. PLAN AS SHOWN ASSUMES EXISTING ROADWAY FILL/ EMBANKMENTS WILL REMAIN.

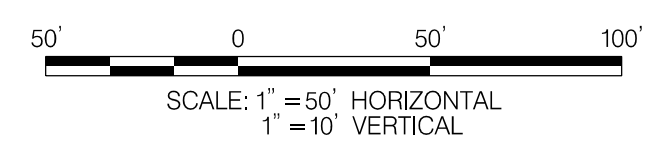
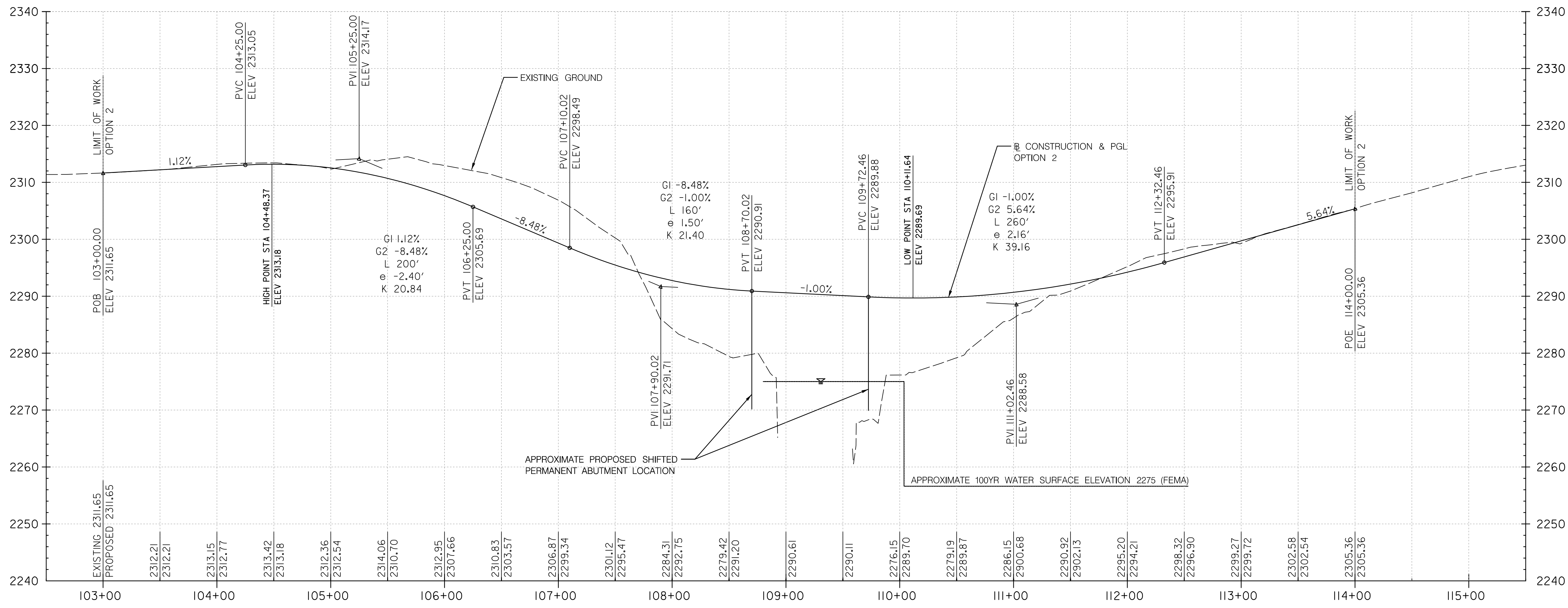


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ROADWAY ALIGNMENT STUDY FOR THE REPLACEMENT OF SWALLOW FALLS ROAD  
BRIDGE NO. G-0020 OVER THE YOUGHIOGHENY RIVER  
OPTION 2 - PLAN AND SECTIONS

CONT. NO. \_\_\_\_\_ F.A.P. NO. \_\_\_\_\_ SHEET NO. 1 OF 2  
PREL. TRAC. BY \_\_\_\_\_ FINAL TRAC. BY \_\_\_\_\_

PLOTTED: Thursday, October 28, 2010 AT 02:29 PM  
 FILE: N:\00\000000\00\_2010 SWA\_Swallow Falls Bridge Design\Drawings\Task 04\_Swallow Falls Bridge\CD\CD\Plan\Study\_Plan\OPTION2\_Swallow Falls.dwg



**OPTION 2 - PERMANENT BRIDGE ALIGNMENT**  
 25 MPH DESIGN SPEED ROADWAY PROFILE WITH ALIGNMENT SHIFTED TO NORTH

PLOTTED: Thursday, October 28, 2010 AT 01:27 PM  
 FILE: N:\2010\10\28\1002\_2010\_SHA\_Summary.dwg  
 User: jg  
 Plot: 100%  
 Plot Device: HP DesignJet 5000PS

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GARRETT COUNTY  
 ROADS DEPARTMENT  
 OAKLAND, MARYLAND  
**ROADWAY ALIGNMENT STUDY FOR THE REPLACEMENT OF SWALLOW FALLS ROAD  
 BRIDGE NO. G-0020 OVER THE YOUGHIOGHENY RIVER  
 OPTION 2 - PROFILE OF PERMANENT BRIDGE**

CONT. NO. \_\_\_\_\_ F.A.P. NO. \_\_\_\_\_ SHEET NO. 2 OF 2  
 PREL. TRAC. BY \_\_\_\_\_ FINAL TRAC. BY \_\_\_\_\_



*APPENDIX C*

**SWALLOW FALLS ROAD BRIDGE REPLACEMENT  
ALTERNATE ALIGNMENT STUDY - OPTION 1**

**PREPARED BY: GREENMAN-PEDERSEN, INC.**

**DATE: October, 2018**

NUM.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL PRICE
<b>CATEGORY 1 - PRELIMINARY</b>					
101	CLEARING AND GRUBBING-Permanent Bridge	Acre	1.76	\$10,000.00	\$17,600.00
102	CLEARING AND GRUBBING-Temporary Bridge	Acre	0.33	\$10,000.00	\$3,300.00
103	TYPE B ENGINEERS FIELD OFFICE	L.S.	1	\$30,000.00	\$30,000.00
104	5 INCH YELLOW PAV'T. MARK. PAINT	L.F.	4200	\$0.25	\$1,050.00
105	5 INCH WHITE PAV'T. MARK. PAINT	L.F.	4200	\$0.20	\$840.00
106	TEMP. TRAFFIC SIGNS HIGH PERF. WIDE ANGLE	S.F.	1100	\$20.00	\$22,000.00
107	MAINTENANCE OF TRAFFIC	L.S.	1	\$90,000.00	\$90,000.00
108	GRADED AGGREGATE BASE FOR MAINTENANCE OF TRAFFIC	TON	580	\$20.00	\$11,600.00
109	ASPHALT FOR MAINTENANCE OF TRAFFIC	TON	760	\$80.00	\$60,800.00
110	TEMP. ORANGE CONSTRUCTION FENCE	L.F.	2200	\$2.00	\$4,400.00
111	TYPE III BARRICADE FOR MOT	EA.	2	\$300.00	\$600.00
112	TEMP. CONC. SINGLE FACE TRAFFIC BARRIER FOR MOT	L.F.	440	\$45.00	\$19,800.00
113	PORTABLE VARIABLE MESSAGE SIGN	U.D.	84	\$100.00	\$8,400.00
114	CONSTRUCTION STAKEOUT	L.S.	1	\$130,000.00	\$130,000.00
115	MOBILIZATION	L.S.	1	\$300,000.00	\$300,000.00
<b>TOTAL CATEGORY 1</b>					<b>\$700,390.00</b>
<b>CATEGORY 2 - GRADING</b>					
201	CLASS 1 EXCAVATION-Permanent Road	C.Y.	400	\$40.00	\$16,000.00
202	CLASS 1 EXCAVATION-Temporary Road	C.Y.	1800	\$40.00	\$72,000.00
203	COMMON BORROW-Permanent Road	C.Y.	3000	\$35.00	\$105,000.00
204	COMMON BORROW-Temporary Road	C.Y.	550	\$35.00	\$19,250.00
<b>TOTAL CATEGORY 2</b>					<b>\$212,250.00</b>
<b>CATEGORY 3 - DRAINAGE</b>					
301	EROSION AND SEDIMENT CONTROL ALLOWANCE	L.S.	1	\$30,000.00	\$30,000.00
302	DRAINAGE & STORMWATER MANAGEMENT ALLOWANCE	L.S.	1	\$30,000.00	\$30,000.00
303	STABILIZED CONSTRUCTION ENTRANCE	EA.	4	\$3,000.00	\$12,000.00
304	CLASS I RIPRAP FOR SLOPE AND CHANNEL PROTECTION	S.Y.	500	\$75.00	\$37,500.00
305	CLASS II RIPRAP FOR SLOPE AND CHANNEL PROTECTION	S.Y.	310	\$140.00	\$43,400.00
306	MAINTENANCE OF STREAM FLOW	L.S.	1	\$30,000.00	\$30,000.00
<b>TOTAL CATEGORY 3</b>					<b>\$182,900.00</b>
<b>CATEGORY 4 - STRUCTURES</b>					
401	RELOCATE EXISTING TEMPORARY BRIDGE	L.S.	1	\$25,000.00	\$25,000.00
402	TEMPORARY ABUTMENTS	L.S.	1	\$67,725.00	\$67,725.00
403	PERMANENT BRIDGE	L.S.	1	\$1,774,500.00	\$1,774,500.00
404	REMOVAL OF RELOCATED TEMPORARY BRIDGE AND ABUTMENTS	L.S.	1	\$10,000.00	\$10,000.00
405	TEMPORARY EXCAVATION SUPPORT	S.F.	1000	\$50.00	\$50,000.00
406	REMOVE EXISTING 2 SPAN BRIDGE	S.F.	2330	\$45.00	\$104,850.00
<b>TOTAL CATEGORY 4</b>					<b>\$2,032,075.00</b>

SWALLOW FALLS ROAD BRIDGE REPLACEMENT ALTERNATE ALIGNMENT STUDY - OPTION 1					
PREPARED BY: GREENMAN-PEDERSEN, INC.					
DATE: October, 2018					
				UNIT	TOTAL
<b>CATEGORY 5 - PAVING</b>					
101	SUPERPAVE ASPHALT MIX 12.5 MM FOR SURFACE, PG64S-22, LEVE	TON	240	\$85.00	\$20,400.00
102	SUPERPAVE ASPHALT MIX 19.0 MM FOR BASE, PG64S-22, LEVEL-2	TON	600	\$130.00	\$78,000.00
103	6 INCH GRADED AGGREGATE BASE COURSE	S.Y.	2225	\$14.00	\$31,150.00
103	GRINDING ASPHALT PAVEMENT 0 INCH TO 2 INCH (Permanent	S.Y.	675	\$5.00	\$3,375.00
104	GRINDING ASPHALT PAVEMENT 0 INCH TO 2 INCH (Temporary	S.Y.	1000	\$5.00	\$5,000.00
104	5 INCH YELLOW PAVEMENT MARKING PAINT LINES	L.F.	1600	\$0.25	\$400.00
105	5 INCH WHITE PAVEMENT MARKING PAINT LINES	L.F.	1600	\$0.25	\$400.00
				<b>TOTAL CATEGORY 5</b>	<b>\$138,725.00</b>
<b>CATEGORY 6 - SHOULDERS</b>					
601	REMOVE AND DISPOSE OF EXISTING TRAFFIC BARRIER	L.F.	500	\$3.00	\$1,500.00
602	TRAFFIC BARRIER W-BEAM USING 6-FOOT POSTS-Permanent	L.F.	450	\$30.00	\$13,500.00
603	TRAFFIC BARRIER W-BEAM USING 6-FOOT POSTS-Temporary	L.F.	350	\$30.00	\$10,500.00
604	TYPE A TRAFFIC BARRIER END TREATMENT	EA.	2	\$2,000.00	\$4,000.00
605	TYPE C TRAFFIC BARRIER END TREATMENT-Permanent Roadway	EA.	2	\$3,000.00	\$6,000.00
606	TYPE C TRAFFIC BARRIER END TREATMENT-Temporary Roadway	EA.	4	\$3,000.00	\$12,000.00
607	5-INCH CONCRETE SIDEWALK	S.F.	820	\$20.00	\$16,400.00
				<b>TOTAL CATEGORY 6</b>	<b>\$63,900.00</b>
<b>CATEGORY 7 - LANDSCAPING</b>					
701	REFORESTATION ALLOWANCE-Permanent Roadway	L.S.	1	\$18,500.00	\$18,500.00
702	REFORESTATION ALLOWANCE-Temporary Roadway	L.S.	1	\$5,000.00	\$5,000.00
703	LANDSCAPE ALLOWANCE	L.S.	1	\$27,900.00	\$27,900.00
704	WETLAND MITIGATION	L.S.	1	\$25,000.00	\$25,000.00
705	PLACED FURNISHED TOPSOIL 2 INCH DEPTH-Permanent Roadway	S.Y.	1600	\$5.00	\$8,000.00
706	PLACED FURNISHED TOPSOIL 2 INCH DEPTH-Temporary Roadway	S.Y.	500	\$5.00	\$2,500.00
706	PLACED FURNISHED TOPSOIL 4 INCH DEPTH-Permanent Roadway	S.Y.	7680	\$8.00	\$61,440.00
707	PLACED FURNISHED TOPSOIL 4 INCH DEPTH-Temporary Roadway	S.Y.	1225	\$8.00	\$9,800.00
707	TEMPORARY MULCH-Permanent Roadway	S.Y.	11750	\$0.75	\$8,812.50
707	TEMPORARY MULCH-Temporary Roadway	S.Y.	2000	\$0.75	\$1,500.00
708	TURFGRASS ESTABLISHMENT-Permanent Roadway	S.Y.	9400	\$1.50	\$14,100.00
708	TURFGRASS ESTABLISHMENT-Temporary Roadway	S.Y.	1600	\$1.50	\$2,400.00
709	TYPE A SOIL STABILIZATION MATTING-Permanent Roadway	S.Y.	2350	\$2.50	\$5,875.00
709	TYPE A SOIL STABILIZATION MATTING-Temporary Roadway	S.Y.	400	\$2.50	\$1,000.00
				<b>TOTAL CATEGORY 7</b>	<b>\$191,827.50</b>
<b>CATEGORY 8 - TRAFFIC</b>					
801	MISC. TRAFFIC ITEMS (SIGNS, ETC.)	L.S.	1	\$5,000.00	\$5,000.00
				<b>TOTAL CATEGORY 8</b>	<b>\$5,000.00</b>
<b>CATEGORY 9 - UTILITIES</b>					
901	RELOCATE EXISTING UTILITY POLES	EA.	7	\$18,000.00	\$126,000.00
				<b>TOTAL CATEGORY 9</b>	<b>\$126,000.00</b>
<b>SUBTOTAL</b>					<b>\$3,653,067.50</b>
<b>40% CONTINGENCY</b>					<b>\$1,461,227.00</b>
<b>TOTAL</b>					<b>\$5,114,294.50</b>

**SWALLOW FALLS ROAD BRIDGE REPLACEMENT  
ALTERNATE ALIGNMENT STUDY - OPTION 2**

**PREPARED BY: GREENMAN-PEDERSEN, INC.**  
**DATE: October, 2018**

NUM.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL PRICE
<b>CATEGORY 1- PRELIMINARY</b>					
101	CLEARING AND GRUBBING	Acre	1.6	\$10,000.00	\$16,000.00
102	TYPE B ENGINEERS FIELD OFFICE	L.S.	1	\$30,000.00	\$30,000.00
103	5 INCH YELLOW PAV'T. MARK. PAINT	L.F.	3500	\$0.25	\$875.00
104	5 INCH WHITE PAV'T. MARK. PAINT	L.F.	3500	\$0.20	\$700.00
105	TEMP. TRAFFIC SIGNS HIGH PERF. WIDE ANGLE RETROREFLECTIVE	S.F.	300	\$20.00	\$6,000.00
106	MAINTENANCE OF TRAFFIC	L.S.	1	\$85,000.00	\$85,000.00
107	TEMP. ORANGE CONSTRUCTION FENCE	L.F.	2400	\$2.00	\$4,800.00
108	TYPE III BARRICADE FOR MOT	EA.	2	\$300.00	\$600.00
109	TEMP. CONC. SINGLE FACE TRAFFIC BARRIER FOR MOT	L.F.	480	\$45.00	\$21,600.00
110	PORTABLE VARIABLE MESSAGE SIGN	U.D.	56	\$100.00	\$5,600.00
111	CONSTRUCTION STAKEOUT	L.S.	1	\$100,000.00	\$100,000.00
112	MOBILIZATION	L.S.	1	\$250,000.00	\$250,000.00
<b>TOTAL CATEGORY 1</b>					<b>\$521,175.00</b>
<b>CATEGORY 2 - GRADING</b>					
201	CLASS 1 EXCAVATION	C.Y.	3400	\$40.00	\$136,000.00
202	CLASS 1-A EXCAVATION (CONTINGENT)	C.Y.	200	\$35.00	\$7,000.00
203	GEOSNYTHETIC STABILIZED SUBGRADE USING GRADED AGGREGATE BASE FOR REFILL OF CLASS 1A EXCAVATION (CONTINGENT)	C.Y.	200	\$75.00	\$15,000.00
204	SELECT BORROW (CONTINGENT)	C.Y.	200	\$80.00	\$16,000.00
205	COMMON BORROW	C.Y.	200	\$35.00	\$7,000.00
206	REMOVAL OF EXISTING PAVEMENT	C.Y.	605	\$30.00	\$18,150.00
<b>TOTAL CATEGORY 2</b>					<b>\$199,150.00</b>
<b>CATEGORY 3 - DRAINAGE</b>					
301	EROSION AND SEDIMENT CONTROL ALLOWANCE	L.S.	1	\$25,000.00	\$25,000.00
302	DRAINAGE & STORMWATER MANAGEMENT ALLOWANCE	L.S.	1	\$30,000.00	\$30,000.00
303	STABILIZED CONSTRUCTION ENTRANCE	EA.	4	\$3,000.00	\$12,000.00
304	CLASS I RIPRAP FOR SLOPE AND CHANNEL PROTECTION	S.Y.	500	\$75.00	\$37,500.00
305	CLASS II RIPRAP FOR SLOPE AND CHANNEL PROTECTION	S.Y.	310	\$140.00	\$43,400.00
306	MAINTENANCE OF STREAM FLOW	L.S.	1	\$60,000.00	\$60,000.00
<b>TOTAL CATEGORY 3</b>					<b>\$207,900.00</b>
<b>CATEGORY 4 - STRUCTURES</b>					
401	PERMANENT BRIDGE	L.S.	1	\$1,774,500.00	\$1,774,500.00
402	REMOVAL OF EXISTING TEMPORARY BRIDGE	L.S.	1	\$18,500.00	\$18,500.00
403	TEMPORARY EXCAVATION SUPPORTS	S.F.	1000	\$50.00	\$50,000.00
404	REMOVAL OF EXISTING 2 SPAN BRIDGE	S.F.	2330	\$45.00	\$104,850.00
<b>TOTAL CATEGORY 4</b>					<b>\$1,947,850.00</b>
<b>CATEGORY 5 - PAVING</b>					
501	SUPERPAVE ASPHALT MIX 12.5 MM FOR SURFACE, PG64S-22, LEVEL-2	TON	420	\$85.00	\$35,700.00
502	SUPERPAVE ASPHALT MIX 19.0 MM FOR BASE, PG64S-22, LEVEL-2	TON	1050	\$130.00	\$136,500.00
503	6 INCH GRADED AGGREGATE BASE COURSE	S.Y.	3900	\$14.00	\$54,600.00
504	GRINDING ASPHALT PAVEMENT 0 INCH TO 2 INCH	S.Y.	675	\$5.00	\$3,375.00
505	5 INCH YELLOW PAVEMENT MARKING PAINT LINES	L.F.	2500	\$0.25	\$625.00
506	5 INCH WHITE PAVEMENT MARKING PAINT LINES	L.F.	2500	\$0.25	\$625.00
<b>TOTAL CATEGORY 5</b>					<b>\$231,425.00</b>

**SWALLOW FALLS ROAD BRIDGE REPLACEMENT  
ALTERNATE ALIGNMENT STUDY - OPTION 2**

**PREPARED BY: GREENMAN-PEDERSEN, INC.**  
**DATE: October, 2018**

				UNIT	TOTAL
<b>CATEGORY 6 - SHOULDERS</b>					
601	REMOVE AND DISPOSE OF EXISTING TRAFFIC BARRIER	L.F.	500	\$3.00	\$1,500.00
602	TRAFFIC BARRIER W-BEAM USING 6-FOOT POSTS	L.F.	350	\$30.00	\$10,500.00
603	TYPE A TRAFFIC BARRIER END TREATMENT	EA.	4	\$2,000.00	\$8,000.00
604	5-INCH CONCRETE SIDEWALK	S.F.	875	\$20.00	\$17,500.00
				<b>TOTAL CATEGORY 6</b>	<b>\$37,500.00</b>
<b>CATEGORY 7 - LANDSCAPING</b>					
701	REFORESTATION ALLOWANCE	L.S.	1	\$16,100.00	\$16,100.00
702	LANDSCAPE ALLOWANCE	L.S.	1	\$20,600.00	\$20,600.00
703	WETLAND MITIGATION	L.S.	1	\$10,000.00	\$10,000.00
704	PLACED FURNISHED TOPSOIL 2 INCH DEPTH	S.Y.	990	\$5.00	\$4,950.00
705	PLACED FURNISHED TOPSOIL 4 INCH DEPTH	S.Y.	6800	\$8.00	\$54,400.00
706	TEMPORARY MULCH	S.Y.	9860	\$0.75	\$7,395.00
707	TURFGRASS ESTABLISHMENT	S.Y.	7800	\$1.50	\$11,700.00
708	TYPE A SOIL STABILIZATION MATTING	S.Y.	3900	\$2.50	\$9,750.00
				<b>TOTAL CATEGORY 7</b>	<b>\$134,895.00</b>
<b>CATEGORY 8 - TRAFFIC</b>					
801	MISC. TRAFFIC ITEMS (SIGNS, ETC.)	L.S.	1	\$5,000.00	\$5,000.00
				<b>TOTAL CATEGORY 8</b>	<b>\$5,000.00</b>
<b>CATEGORY 9 - UTILITIES</b>					
901	RELOCATE EXISTING UTILITY POLES	EA.	4	\$18,000.00	\$72,000.00
				<b>TOTAL CATEGORY 9</b>	<b>\$72,000.00</b>
<b>SUBTOTAL</b>					<b>\$3,356,895.00</b>
<b>40% CONTINGENCY</b>					<b>\$1,342,758.00</b>
<b>TOTAL</b>					<b>\$4,699,653.00</b>



SWALLOW FALLS ROAD BRIDGE REPLACEMENT ALTERNATE ALIGNMENT STUDY - OPTION 1B					
PREPARED BY: GREENMAN-PEDERSEN, INC.					
DATE: October, 2018					
NUM.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL PRICE
<b>CATEGORY 1 - PRELIMINARY</b>					
101	CLEARING AND GRUBBING-Permanent Bridge	Acre	1.76	\$10,000.00	\$17,600.00
102	CLEARING AND GRUBBING-Slide In Bridge	Acre	0.11	\$10,000.00	\$1,100.00
103	TYPE B ENGINEERS FIELD OFFICE	L.S.	1	\$30,000.00	\$30,000.00
104	TEMP. TRAFFIC SIGNS HIGH PERF. WIDE ANGLE	S.F.	1100	\$20.00	\$22,000.00
105	MAINTENANCE OF TRAFFIC	L.S.	1	\$47,000.00	\$47,000.00
106	GRADED AGGREGATE BASE FOR MAINTENANCE OF TRAFFIC	TON	190	\$20.00	\$3,800.00
107	TEMP. ORANGE CONSTRUCTION FENCE	L.F.	2200	\$2.00	\$4,400.00
108	TYPE III BARRICADE FOR MOT	EA.	2	\$300.00	\$600.00
109	TEMP. CONC. SINGLE FACE TRAFFIC BARRIER FOR MOT	L.F.	200	\$45.00	\$9,000.00
110	PORTABLE VARIABLE MESSAGE SIGN	U.D.	94	\$100.00	\$9,400.00
111	CONSTRUCTION STAKEOUT	L.S.	1	\$148,000.00	\$148,000.00
112	MOBILIZATION	L.S.	1	\$275,000.00	\$275,000.00
<b>TOTAL CATEGORY 1</b>					<b>\$567,900.00</b>
<b>CATEGORY 2 - GRADING</b>					
201	CLASS 1 EXCAVATION-Permanent Road	C.Y.	400	\$40.00	\$16,000.00
202	COMMON BORROW-Permanent Road	C.Y.	2400	\$35.00	\$84,000.00
203	COMMON BORROW-Temporary Access for Slide In Bridge	C.Y.	925	\$35.00	\$32,375.00
<b>TOTAL CATEGORY 2</b>					<b>\$132,375.00</b>
<b>CATEGORY 3 - DRAINAGE</b>					
301	EROSION AND SEDIMENT CONTROL ALLOWANCE	L.S.	1	\$30,000.00	\$30,000.00
302	DRAINAGE & STORMWATER MANAGEMENT ALLOWANCE	L.S.	1	\$30,000.00	\$30,000.00
303	STABILIZED CONSTRUCTION ENTRANCE	EA.	4	\$3,000.00	\$12,000.00
304	CLASS I RIPRAP FOR SLOPE AND CHANNEL PROTECTION	S.Y.	500	\$75.00	\$37,500.00
305	CLASS II RIPRAP FOR SLOPE AND CHANNEL PROTECTION	S.Y.	310	\$140.00	\$43,400.00
306	MAINTENANCE OF STREAM FLOW	L.S.	1	\$30,000.00	\$30,000.00
<b>TOTAL CATEGORY 3</b>					<b>\$182,900.00</b>
<b>CATEGORY 4 - STRUCTURES</b>					
401	PERMANENT BRIDGE	L.S.	1	\$2,213,000.00	\$2,213,000.00
402	REMOVE EXISTING TEMPORARY BRIDGE	L.S.	1	\$18,500.00	\$18,500.00
403	REMOVE EXISTING 2 SPAN BRIDGE	S.F.	2330	\$45.00	\$104,850.00
<b>TOTAL CATEGORY 4</b>					<b>\$2,336,350.00</b>
<b>CATEGORY 5 - PAVING</b>					
101	SUPERPAVE ASPHALT MIX 12.5 MM FOR SURFACE, PG64S-22, LEVE	TON	240	\$85.00	\$20,400.00
102	SUPERPAVE ASPHALT MIX 19.0 MM FOR BASE, PG64S-22, LEVEL-2	TON	600	\$130.00	\$78,000.00
103	6 INCH GRADED AGGREGATE BASE COURSE	S.Y.	2225	\$14.00	\$31,150.00
103	GRINDING ASPHALT PAVEMENT 0 INCH TO 2 INCH (Permanent	S.Y.	675	\$5.00	\$3,375.00
104	5 INCH YELLOW PAVEMENT MARKING PAINT LINES	L.F.	1600	\$0.25	\$400.00
104	5 INCH WHITE PAVEMENT MARKING PAINT LINES	L.F.	1600	\$0.25	\$400.00
<b>TOTAL CATEGORY 5</b>					<b>\$133,725.00</b>

<b>SWALLOW FALLS ROAD BRIDGE REPLACEMENT ALTERNATE ALIGNMENT STUDY - OPTION 1B</b>					
<b>PREPARED BY: GREENMAN-PEDERSEN, INC.</b>					
<b>DATE: October, 2018</b>					
				<b>UNIT</b>	<b>TOTAL</b>
<b>CATEGORY 6 - SHOULDERS</b>					
601	REMOVE AND DISPOSE OF EXISTING TRAFFIC BARRIER	L.F.	500	\$3.00	\$1,500.00
602	TRAFFIC BARRIER W-BEAM USING 6-FOOT POSTS-Permanent	L.F.	450	\$30.00	\$13,500.00
603	TYPE A TRAFFIC BARRIER END TREATMENT	EA.	2	\$2,000.00	\$4,000.00
604	TYPE C TRAFFIC BARRIER END TREATMENT-Permanent Roadway	EA.	2	\$3,000.00	\$6,000.00
605	5-INCH CONCRETE SIDEWALK	S.F.	820	\$20.00	\$16,400.00
				<b>TOTAL CATEGORY 6</b>	<b>\$41,400.00</b>
<b>CATEGORY 7 - LANDSCAPING</b>					
701	REFORESTATION ALLOWANCE-Permanent Roadway	L.S.	1	\$18,500.00	\$18,500.00
701	REFORESTATION ALLOWANCE-Slide in Access Area	L.S.	1	\$2,000.00	\$2,000.00
702	LANDSCAPE ALLOWANCE	L.S.	1	\$27,900.00	\$27,900.00
703	WETLAND MITIGATION	L.S.	1	\$25,000.00	\$25,000.00
704	PLACED FURNISHED TOPSOIL 2 INCH DEPTH-Permanent Roadway	S.Y.	1600	\$5.00	\$8,000.00
705	PLACED FURNISHED TOPSOIL 2 INCH DEPTH-Slide in Access Area	S.Y.	275	\$5.00	\$1,375.00
704	PLACED FURNISHED TOPSOIL 4 INCH DEPTH-Permanent Roadway	S.Y.	7680	\$8.00	\$61,440.00
705	PLACED FURNISHED TOPSOIL 4 INCH DEPTH-Slide in Access Area	S.Y.	275	\$8.00	\$2,200.00
706	TEMPORARY MULCH-Permanent Roadway	S.Y.	11750	\$0.75	\$8,812.50
706	TURFGRASS ESTABLISHMENT-Permanent Roadway	S.Y.	9400	\$1.50	\$14,100.00
707	TURFGRASS ESTABLISHMENT-Slide in Access Area	S.Y.	555	\$1.50	\$832.50
708	TYPE A SOIL STABILIZATION MATTING-Permanent Roadway	S.Y.	2350	\$2.50	\$5,875.00
				<b>TOTAL CATEGORY 7</b>	<b>\$176,035.00</b>
<b>CATEGORY 8 - TRAFFIC</b>					
801	MISC. TRAFFIC ITEMS (SIGNS, ETC.)	L.S.	1	\$5,000.00	\$5,000.00
				<b>TOTAL CATEGORY 8</b>	<b>\$5,000.00</b>
<b>CATEGORY 9 - UTILITIES</b>					
901	RELOCATE EXISTING UTILITY POLES	EA.	7	\$18,000.00	\$126,000.00
				<b>TOTAL CATEGORY 9</b>	<b>\$126,000.00</b>
<b>SUBTOTAL</b>					<b>\$3,701,685.00</b>
<b>40% CONTINGENCY</b>					<b>\$1,480,674.00</b>
<b>TOTAL</b>					<b>\$5,182,359.00</b>

**SWALLOW FALLS ROAD BRIDGE REPLACEMENT  
ALTERNATE ALIGNMENT STUDY - OPTION 1C**

PREPARED BY: GREENMAN-PEDERSEN, INC.  
DATE: October, 2018

NUM.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL PRICE
<b>CATEGORY 1- PRELIMINARY</b>					
101	CLEARING AND GRUBBING	Acre	1.76	\$10,000.00	\$17,600.00
102	TYPE B ENGINEERS FIELD OFFICE	L.S.	1	\$30,000.00	\$30,000.00
103	5 INCH YELLOW PAVT. MARK. PAINT	L.F.	4200	\$0.25	\$1,050.00
104	5 INCH WHITE PAVT. MARK. PAINT	L.F.	4200	\$0.20	\$840.00
105	TEMP. TRAFFIC SIGNS HIGH PERF. WIDE ANGLE RETROREFLECTIVE	S.F.	1100	\$20.00	\$22,000.00
106	MAINTENANCE OF TRAFFIC	L.S.	1	\$85,000.00	\$85,000.00
107	TEMP. ORANGE CONSTRUCTION FENCE	L.F.	2200	\$2.00	\$4,400.00
108	TYPE III BARRICADE FOR MOT	EA.	2	\$300.00	\$600.00
109	TEMP. CONC. SINGLE FACE TRAFFIC BARRIER FOR MOT	L.F.	800	\$45.00	\$36,000.00
110	PORTABLE VARIABLE MESSAGE SIGN	U.D.	84	\$100.00	\$8,400.00
111	CONSTRUCTION STAKEOUT	L.S.	1	\$100,000.00	\$100,000.00
112	MOBILIZATION	L.S.	1	\$250,000.00	\$250,000.00
<b>TOTAL CATEGORY 1</b>					<b>\$555,890.00</b>
<b>CATEGORY 2 - GRADING</b>					
201	CLASS 1 EXCAVATION-Permanent Road	C.Y.	400	\$40.00	\$16,000.00
202	COMMON BORROW-Permanent Road	C.Y.	3000	\$35.00	\$105,000.00
<b>TOTAL CATEGORY 2</b>					<b>\$121,000.00</b>
<b>CATEGORY 3 - DRAINAGE</b>					
301	EROSION AND SEDIMENT CONTROL ALLOWANCE	L.S.	1	\$30,000.00	\$30,000.00
302	DRAINAGE & STORMWATER MANAGEMENT ALLOWANCE	L.S.	1	\$30,000.00	\$30,000.00
303	STABILIZED CONSTRUCTION ENTRANCE	EA.	4	\$3,000.00	\$12,000.00
304	CLASS I RIPRAP FOR SLOPE AND CHANNEL PROTECTION	S.Y.	500	\$75.00	\$37,500.00
305	CLASS II RIPRAP FOR SLOPE AND CHANNEL PROTECTION	S.Y.	310	\$140.00	\$43,400.00
306	MAINTENANCE OF STREAM FLOW	L.S.	1	\$30,000.00	\$30,000.00
<b>TOTAL CATEGORY 3</b>					<b>\$182,900.00</b>
<b>CATEGORY 4 - STRUCTURES</b>					
401	PERMANENT BRIDGE	L.S.	1	\$1,924,500.00	\$1,924,500.00
402	REMOVE EXISTING TEMPORARY BRIDGE	L.S.	1	\$18,500.00	\$18,500.00
403	TEMPORARY EXCAVATION SUPPORT	S.F.	0	\$50.00	\$0.00
404	REMOVE EXISTING 2 SPAN BRIDGE	S.F.	2330	\$45.00	\$104,850.00
<b>TOTAL CATEGORY 4</b>					<b>\$2,047,850.00</b>
<b>CATEGORY 5 - PAVING</b>					
501	SUPERPAVE ASPHALT MIX 12.5 MM FOR SURFACE, PG64S-22, LEVEL-2	TON	240	\$85.00	\$20,400.00
502	SUPERPAVE ASPHALT MIX 19.0 MM FOR BASE, PG64S-22, LEVEL-2	TON	600	\$130.00	\$78,000.00
503	6 INCH GRADED AGGREGATE BASE COURSE	S.Y.	2225	\$14.00	\$31,150.00
503	GRINDING ASPHALT PAVEMENT 0 INCH TO 2 INCH (Permanent Roadway)	S.Y.	675	\$5.00	\$3,375.00
504	5 INCH YELLOW PAVEMENT MARKING PAINT LINES	L.F.	1600	\$0.25	\$400.00
504	5 INCH WHITE PAVEMENT MARKING PAINT LINES	L.F.	1600	\$0.25	\$400.00
<b>TOTAL CATEGORY 5</b>					<b>\$133,725.00</b>

**SWALLOW FALLS ROAD BRIDGE REPLACEMENT  
ALTERNATE ALIGNMENT STUDY - OPTION 1C**

PREPARED BY: GREENMAN-PEDERSEN, INC.  
DATE: October, 2018

				UNIT	TOTAL
<b>CATEGORY 6 - SHOULDERS</b>					
601	REMOVE AND DISPOSE OF EXISTING TRAFFIC BARRIER	L.F.	500	\$3.00	\$1,500.00
602	TRAFFIC BARRIER W-BEAM USING 6-FOOT POSTS-Permanent Roadway	L.F.	450	\$30.00	\$13,500.00
603	TYPE A TRAFFIC BARRIER END TREATMENT	EA.	2	\$2,000.00	\$4,000.00
604	TYPE C TRAFFIC BARRIER END TREATMENT-Permanent Roadway	EA.	2	\$3,000.00	\$6,000.00
605	5-INCH CONCRETE SIDEWALK	S.F.	820	\$20.00	\$16,400.00
<b>TOTAL CATEGORY 6</b>					<b>\$41,400.00</b>
<b>CATEGORY 7 - LANDSCAPING</b>					
701	REFORESTATION ALLOWANCE-Permanent Roadway	L.S.	1	\$18,500.00	\$18,500.00
702	LANDSCAPE ALLOWANCE	L.S.	1	\$27,900.00	\$27,900.00
703	WETLAND MITIGATION	L.S.	1	\$25,000.00	\$25,000.00
704	PLACED FURNISHED TOPSOIL 2 INCH DEPTH-Permanent Roadway	S.Y.	1600	\$5.00	\$8,000.00
705	PLACED FURNISHED TOPSOIL 4 INCH DEPTH-Permanent Roadway	S.Y.	7680	\$8.00	\$61,440.00
706	TEMPORARY MULCH-Permanent Roadway	S.Y.	11750	\$0.75	\$8,812.50
707	TURFGRASS ESTABLISHMENT-Permanent Roadway	S.Y.	9400	\$1.50	\$14,100.00
708	TYPE A SOIL STABILIZATION MATTING-Permanent Roadway	S.Y.	2350	\$2.50	\$5,875.00
<b>TOTAL CATEGORY 7</b>					<b>\$169,627.50</b>
<b>CATEGORY 8 - TRAFFIC</b>					
801	MISC. TRAFFIC ITEMS (SIGNS, ETC.)	L.S.	1	\$5,000.00	\$5,000.00
<b>TOTAL CATEGORY 8</b>					<b>\$5,000.00</b>
<b>CATEGORY 9 - UTILITIES</b>					
901	RELOCATE EXISTING UTILITY POLES	EA.	7	\$18,000.00	\$126,000.00
<b>TOTAL CATEGORY 9</b>					<b>\$126,000.00</b>
<b>SUBTOTAL</b>					<b>\$3,383,392.50</b>
<b>40% CONTINGENCY</b>					<b>\$1,353,357.00</b>
<b>TOTAL</b>					<b>\$4,736,749.50</b>



***APPENDIX D***

DECISION ANALYSIS WORKSHEET  
ALIGNMENT STUDY

Contract No. : BCS 2009-03J, Task No. 54 (SHA Consultant Contract No.)  
Description: Replacement of Swall Falls Rd Bridge No. G-0020 over the Youghiogheny River

Sheet 1 of 1  
10/25/18

Decision Statement: Should we maintain existing alignment, or shift new permanent alignment 35'± to the north?

Objectives \ Alternatives		Option 1: Maintain Existing Alignment (w/ temp. bridge & roadway)	Option 1b: Maintain Existing Alignment (w/out temp. bridge or roadway) <i>Utilize ABC Techniques</i>	Option 1c: Maintain Existing Alignment (w/out temp. bridge or roadway) <i>ABC / Conventional Construction</i>	Option 2: New Permanent Alignment (Shifted North)				
<b>Design Parameters</b>									
Construction Costs:		\$5.11 M	\$5.18 M	\$4.74 M	\$4.70 M				
Design Speed:		New Br. = 30 mph / Temp Br. = 15 mph	New Bridge = 30 mph	New Bridge = 30 mph	New Bridge = 25 mph				
Approach/Exit Grades:		Grades: - 6.36% Appr., + 4.34% Exit	Grades: - 6.36% Appr., + 4.34% Exit	Grades: - 6.36% Appr., + 4.34% Exit	Grades: - 8.48% Appr., + 5.64% Exit				
Span Length:		Span Length = 120.0' ±	Span Length = 120.0' ±	Span Length = 120.0' ±	Span Length = 120.0' ±				
Anticipated Total Construction Duration		18 (+/-) Months	14 (+/-) Months	6 (+/-) Months	16 (+/-) Months				
Anticipated Traffic Closure Duration		< 7 Days (total)	Approximately 1 Month	Approximately 3 Months	0 days				
<b>SUBJECTIVE CRITERIA</b>	<b>Weight</b>	<b>Comments</b>	<b>Score</b>	<b>Comments</b>	<b>Score</b>	<b>Comments</b>	<b>Score</b>		
<u>Cost</u>	10	A high cost option using full conventional construction. Costs required to relocate temporary bridge.	6 60	Highest cost option using full ABC construction.	5 50	A lower cost option using combination of ABC and conventional construction.	9 90	Least cost option using full conventional construction. No costs to relocate temporary bridge.	10 100
<u>Construction Duration</u>	4	<u>Duration impacted by:</u> - Full Conventional construction - Multiple phases - Shortened "construction seasons" due to weather	5 20	<u>Duration impacted by:</u> - Conventional construction for Slide-in deck and ABC for abutments - Shortened "construction seasons" due to weather	7 28	<u>Duration impacted by:</u> - Multiple activities assumed concurrent due to fewer access restrictions	10 40	<u>Duration impacted by:</u> - Full Conventional construction - Shortened "construction seasons" due to weather	6 24
<u>Road Closure Duration</u>	8	<u>Anticipated Road Closures:</u> - Short-term closure (approx. 1 week) - When Acrow bridge is relocated to temporary alignment.	9 72	<u>Anticipated Road Closures:</u> - Short-term closure (approx. 3 days) - When girders are delivered and erected in temporary slide in bridge location. - Longer closure (approx. 1 month) for abutment construction using ABC, slide in of superstructure and approach road work.	6 48	<u>Anticipated Road Closures:</u> - Long-term closure (approx. 3 months) - To construct abutments using ABC and pour deck using conventional methods. - Complete final work on parpets, sidewalk and roadside using one lane of two-way traffic on completed deck	4 32	<u>Anticipated Road Closures:</u> - None; flagging operations utilized	10 80
<u>Alignment Geometry</u>	5	New Br. = 30 mph / Temp Br. = 15 mph Grades: - 6.36% Appr., + 4.34% Exit	10 50	New Br. = 30 mph Grades: - 6.36% Appr., + 4.34% Exit	10 50	New Br. = 30 mph Grades: - 6.36% Appr., + 4.34% Exit	10 50	New Br. = 25 mph Grades: - 8.48% Appr., + 5.64% Exit	7 35
<u>Right-of-Way Impacts</u>	9	Requires less Fee Simple ROW but requires temporary construction easement for temporary bridge alignment	6 54	Requires less Fee Simple ROW, but requires temporary construction easements for Slide-In Bridge construction access	7 63	Requires less Fee Simple ROW and less temporary construction easements	10 90	Requires most Fee Simple ROW and requires some Land and Water Conservation Fund area	3 27
<u>Environmental Impacts</u>	10	Largest impact to forests (1.55 acres), specimen trees and wetlands	4 40	Impacts to forests (1.33 acres), specimen trees and wetlands	6 60	Less impacts to forests (1.22 acres), specimen trees and wetlands	8 80	Least impacts to forests (1.07 acres), specimen trees and some wetlands	10 100

Max Score Possible: 460

Total Points: 296

Total Points: 299

Total Points: 382

Total Points: 366

Score (% of max): 64.3%

Score (% of max): 65.0%

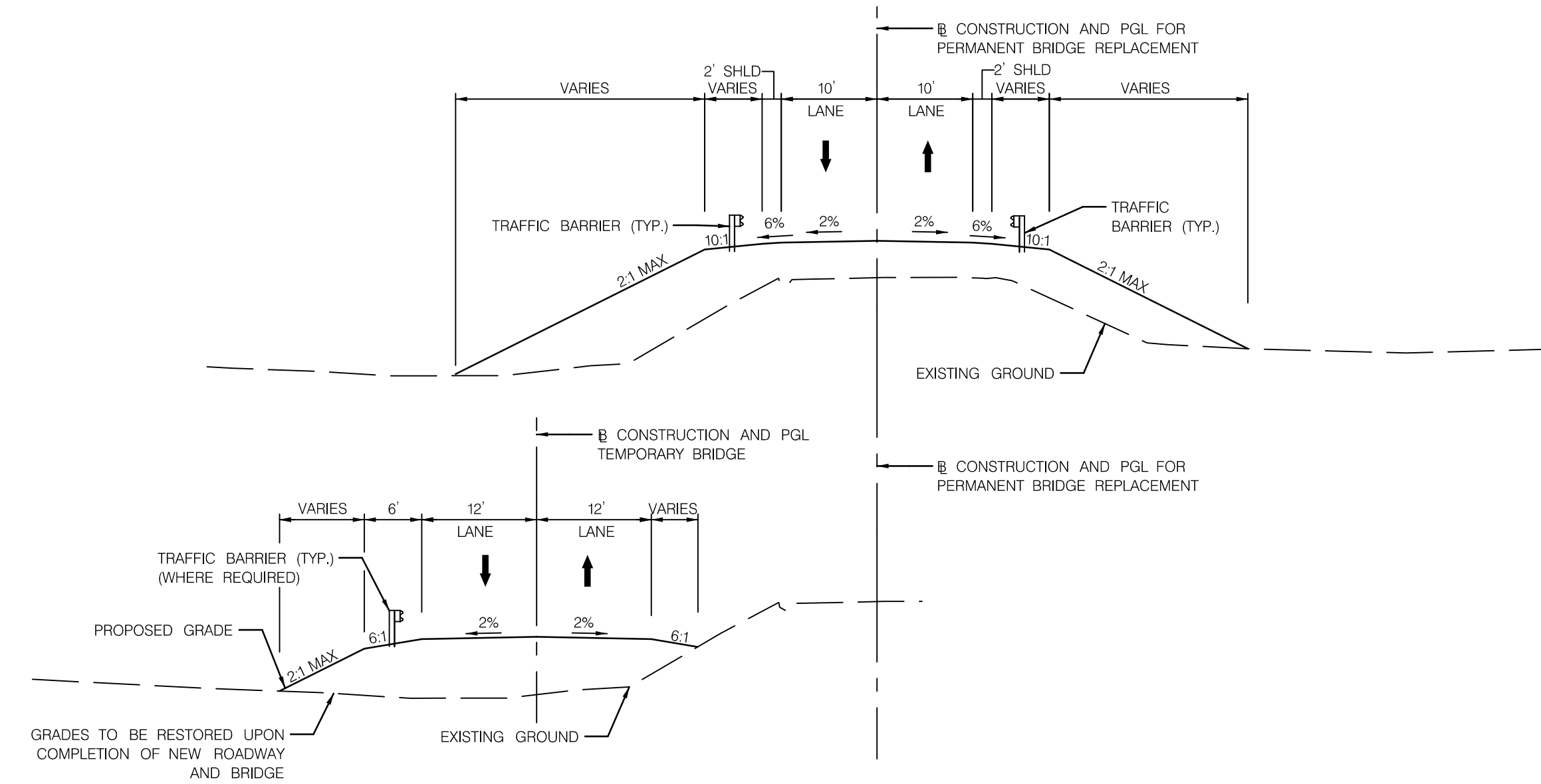
Score (% of max): 83.0%

Score (% of max): 79.6%

## **Appendix F – Current Design Alternative Display Exhibits**

OPTION 1 - MAINTAIN EXISTING PERMANENT BRIDGE CENTERLINE WITH TEMPORARY ROADWAY AND BRIDGE TO THE NORTH

25 MPH DESIGN SPEED ROADWAY ALIGNMENT TO MATCH EXISTING CENTER LINE OF SWALLOW FALLS ROAD.  
 EXISTING SINGLE SPAN ACROW PANEL TRUSS STRUCTURE TO BE RELOCATED TO THE NORTH SIDE OF THE  
 EXISTING BRIDGE USING A TEMPORARY ROADWAY SHIFT BASED ON A 15 MPH DESIGN SPEED TO ALLOW  
 SWALLOW FALLS ROAD TO REMAIN OPEN TO TRAFFIC DURING CONSTRUCTION OF A NEW BRIDGE.

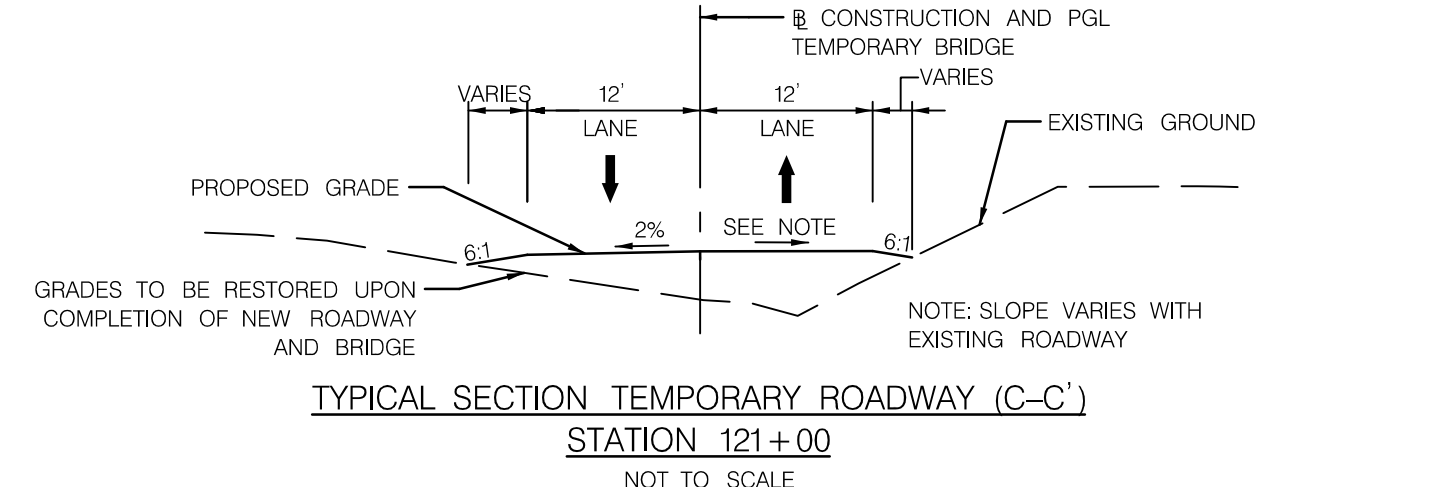
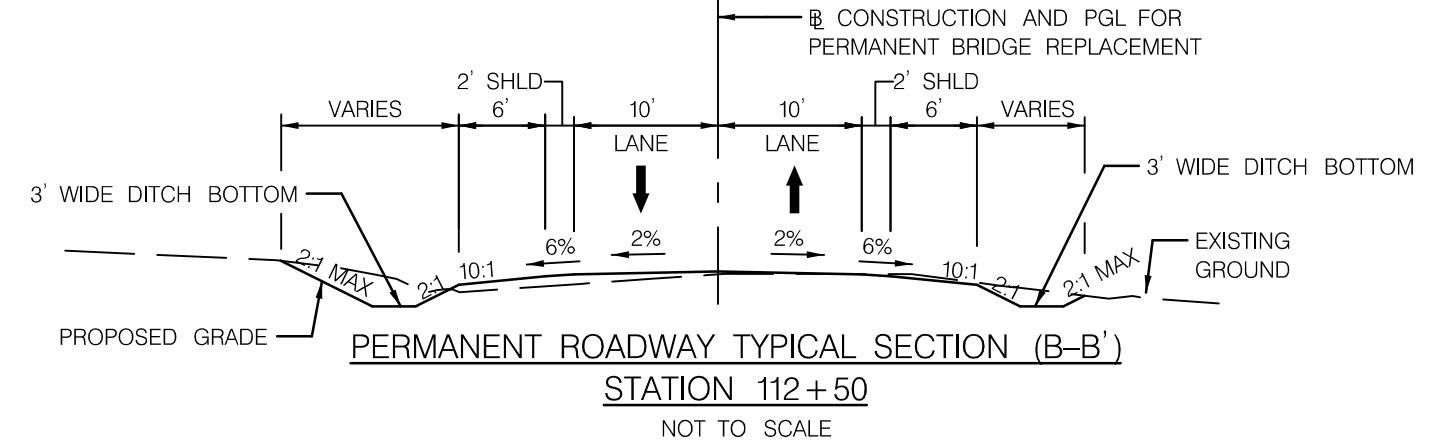
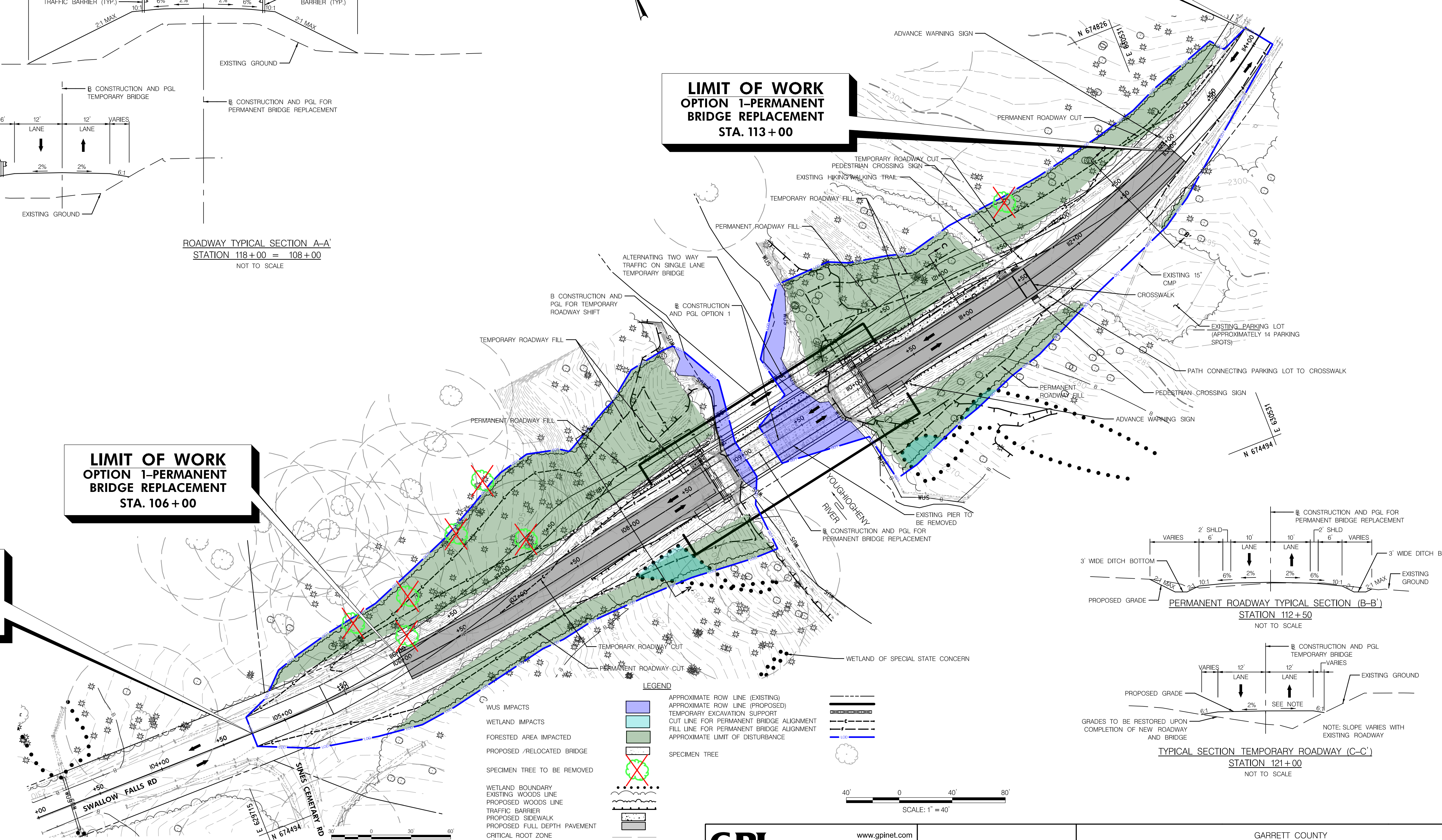


**LIMIT OF WORK**  
**OPTION 1-TEMPORARY**  
**ROADWAY SHIFT**  
**STA. 104+73.08**  
**= STA. 114+73.08**

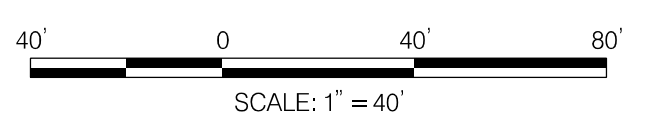
**LIMIT OF WORK**  
**OPTION 1-PERMANENT**  
**BRIDGE REPLACEMENT**  
**STA. 106+00**

**LIMIT OF WORK**  
**OPTION 1-PERMANENT**  
**BRIDGE REPLACEMENT**  
**STA. 113+00**

**LIMIT OF WORK**  
**OPTION 1-TEMPORARY**  
**ROADWAY SHIFT**  
**STA. 114+08.57 =**  
**STA. 124+06.87**



- LEGEND**
- APPROXIMATE ROW LINE (EXISTING)
  - APPROXIMATE ROW LINE (PROPOSED)
  - TEMPORARY EXCAVATION SUPPORT
  - CUT LINE FOR PERMANENT BRIDGE ALIGNMENT
  - FILL LINE FOR PERMANENT BRIDGE ALIGNMENT
  - APPROXIMATE LIMIT OF DISTURBANCE
  - SPECIMEN TREE
  - WETLAND OF SPECIAL STATE CONCERN
  - WETLAND BOUNDARY
  - EXISTING WOODS LINE
  - PROPOSED WOODS LINE
  - TRAFFIC BARRIER
  - PROPOSED SIDEWALK
  - PROPOSED FULL DEPTH PAVEMENT
  - CRITICAL ROOT ZONE
  - 25' WETLAND BUFFER



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GARRETT COUNTY  
 ROADS DEPARTMENT  
 OAKLAND, MARYLAND  
 REPLACEMENT OF SWALLOW FALLS ROAD BRIDGE NO. G-0020  
 OVER THE YOUGHIOGHENY RIVER  
 OPTION 1 - PLAN AND SECTIONS

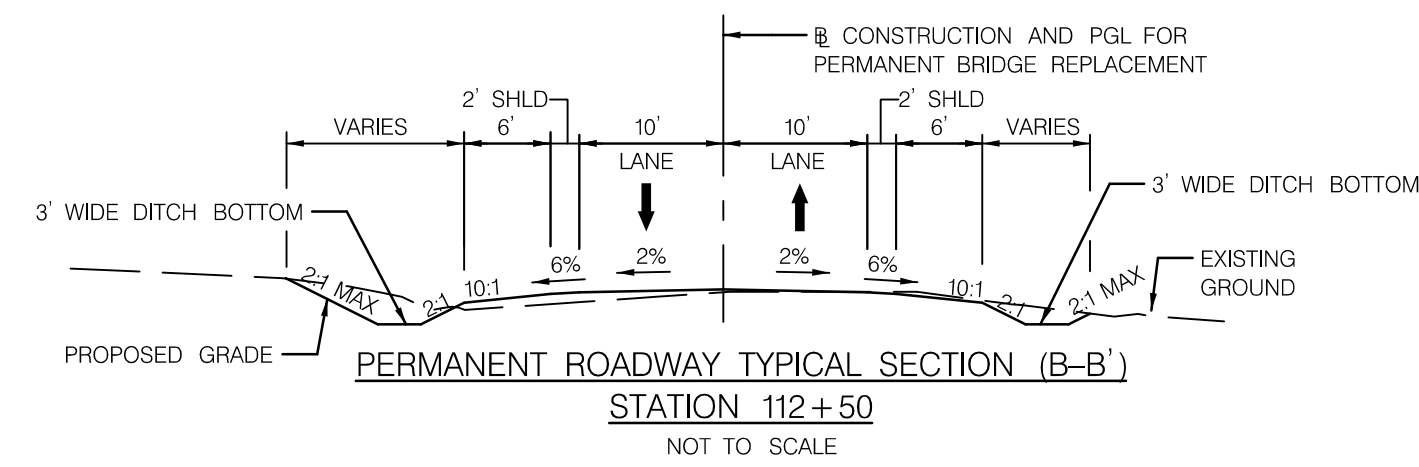
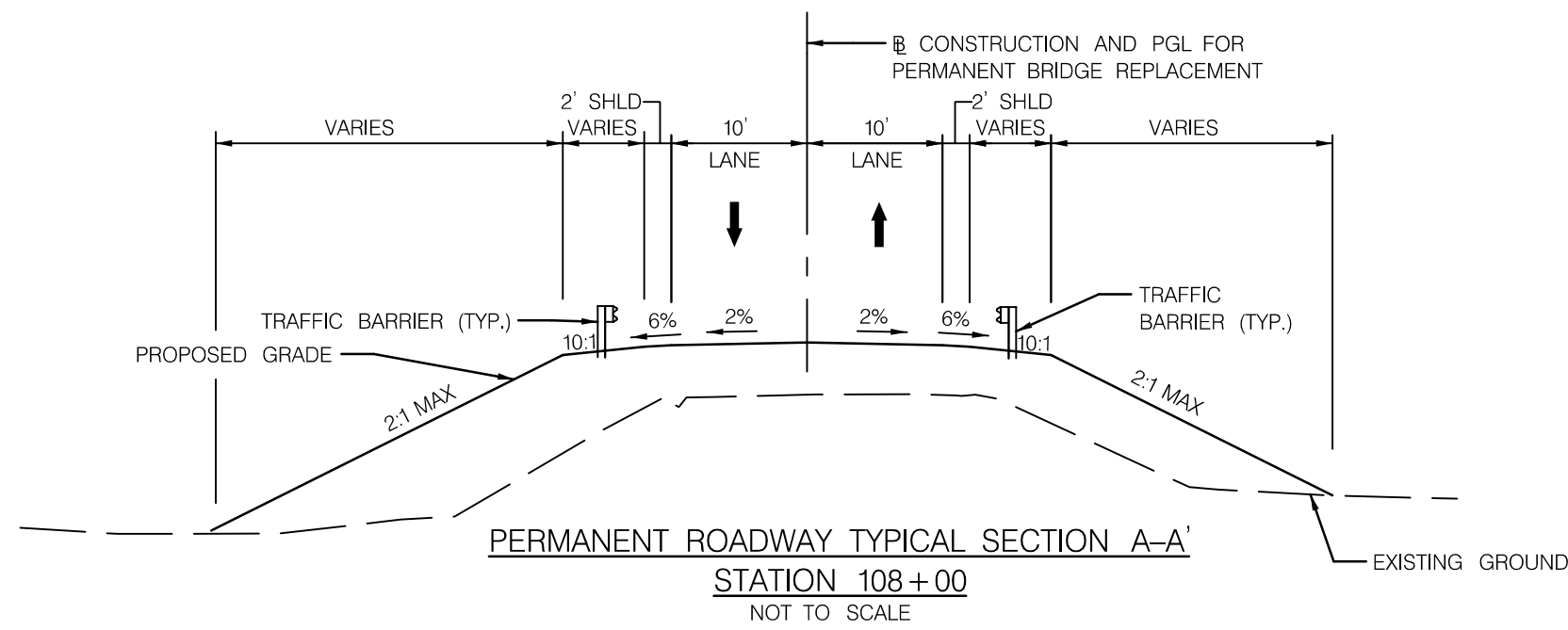
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 PREL. TRAC. BY FINAL TRAC. BY

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 USER: JGRIFFIN  
 PLOTTER: HP DesignJet T1300PS



OPTION 1C - MAINTAIN EXISTING PERMANENT BRIDGE CENTERLINE NO TEMPORARY ROADWAY AND BRIDGE TO THE NORTH

- 25 MPH DESIGN SPEED ROADWAY ALIGNMENT TO MATCH EXISTING CENTER LINE OF SWALLOW FALLS ROAD.
- SWALLOW FALLS ROAD WOULD BE CLOSED AND TRAFFIC DETOURED DURING CONSTRUCTION OF NEW BRIDGE.



**LEGEND**

CUT LINE	
FILL LINE	
APPROXIMATE LIMIT OF DISTURBANCE	
PROPOSED SIDEWALK	
PROPOSED FULL DEPTH PAVEMENT	
PROPOSED BRIDGE	
EXISTING WOODS LINE	
PROPOSED WOODS LINE	
APPROXIMATE ROW LINE (EXISTING)	
APPROXIMATE ROW LINE (PROPOSED)	
TRAFFIC BARRIER	
WETLAND BOUNDARY	
25' WETLAND BUFFER	
CRITICAL ROOT ZONE	
WUS IMPACTS	
WETLAND IMPACTS	
FORESTED AREA IMPACTS	
SPECIMEN TREE TO BE REMOVED	
DITCH CENTERLINE	
SPECIMEN TREE	

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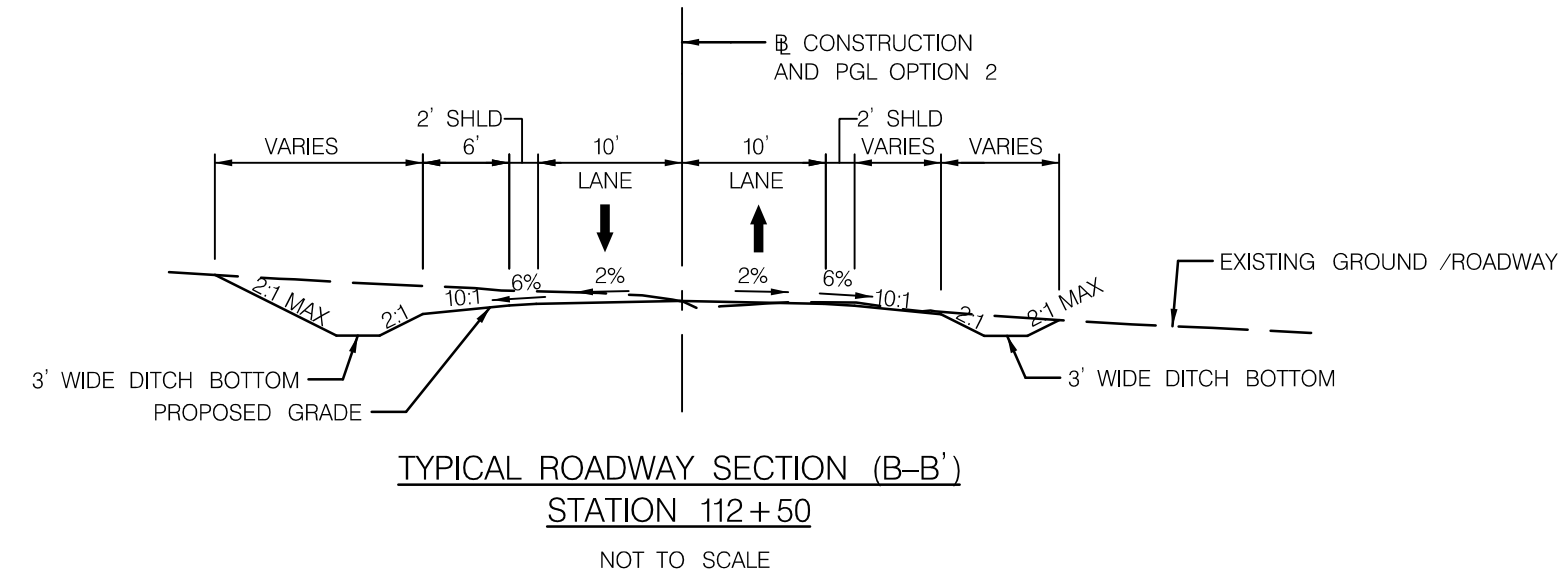
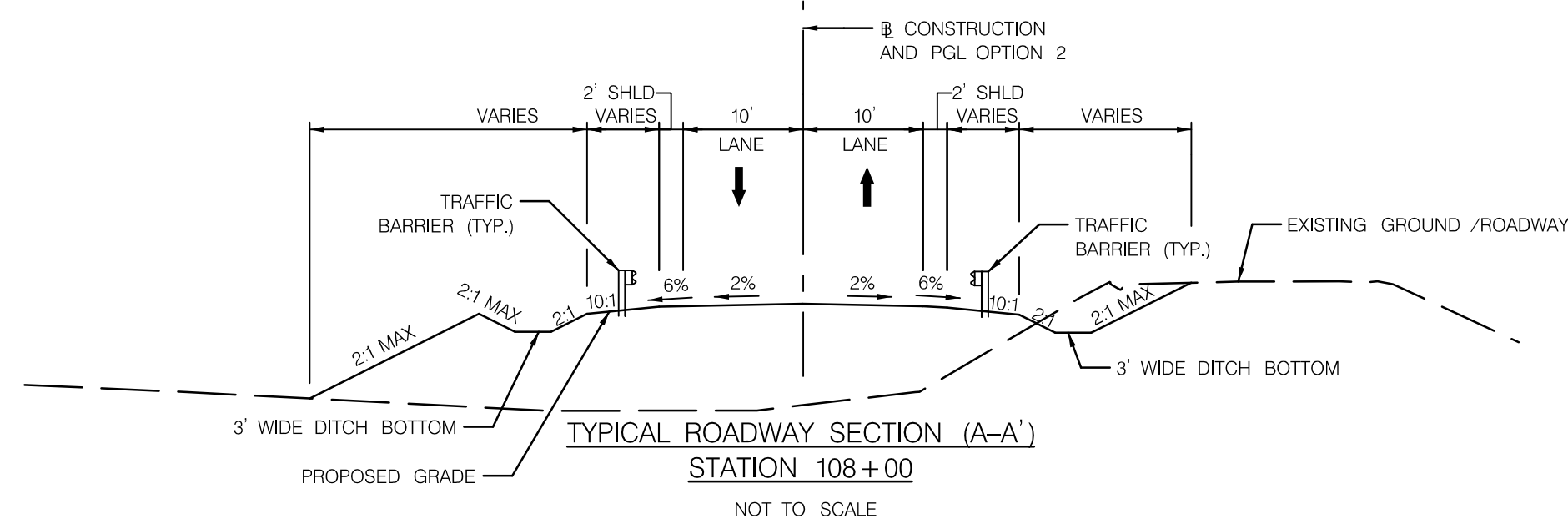
GARRETT COUNTY  
 ROADS DEPARTMENT  
 OAKLAND, MARYLAND  
 REPLACEMENT OF SWALLOW FALLS ROAD BRIDGE NO. G-0020  
 OVER THE YOUGHIOGHENY RIVER  
 OPTION 1C - PLAN AND SECTIONS

CONT. NO. TBD F.A.P. NO. TBD SHEET NO. X OF 17  
 PREL. TRAC. BY FINAL TRAC. BY

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OPTION 2 - SHIFT PERMANENT BRIDGE CENTERLINE TO THE NORTH AND USE EXISTING BRIDGE TO MAINTAIN TRAFFIC

25 MPH DESIGN SPEED WITH ALIGNMENT SHIFTED TO THE NORTH SIDE OF THE EXISTING BRIDGE. EXISTING BRIDGE TO REMAIN IN OPERATION TO ALLOW SWALLOW FALLS ROAD TO REMAIN OPEN TO TRAFFIC DURING CONSTRUCTION OF A NEW BRIDGE.



**LIMIT OF WORK**  
OPTION 2  
STA. 102+50

**LIMIT OF WORK**  
OPTION 2  
STA. 115+00



**LEGEND**

CUT LINE	---
FILL LINE	---
APPROXIMATE LIMIT OF DISTURBANCE	---
PROPOSED SIDEWALK	---
PROPOSED FULL DEPTH PAVEMENT	---
PROPOSED BRIDGE	---
EXISTING WOODS LINE	---
PROPOSED WOODS LINE	---
APPROXIMATE ROW LINE (EXISTING)	---
APPROXIMATE ROW LINE (PROPOSED)	---
TRAFFIC BARRIER	---
WETLAND BOUNDARY	---
25' WETLAND BUFFER	---
CRITICAL ROOT ZONE	---
WUS IMPACTS	---
WETLAND IMPACTS	---
FORESTED AREA IMPACTS	---
SPECIMEN TREE TO BE REMOVED	---
DITCH CENTERLINE	---
SPECIMEN TREE	---



PLOTTED: 6/20/2023  
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 PLOTTER: HP DesignJet T1300PS

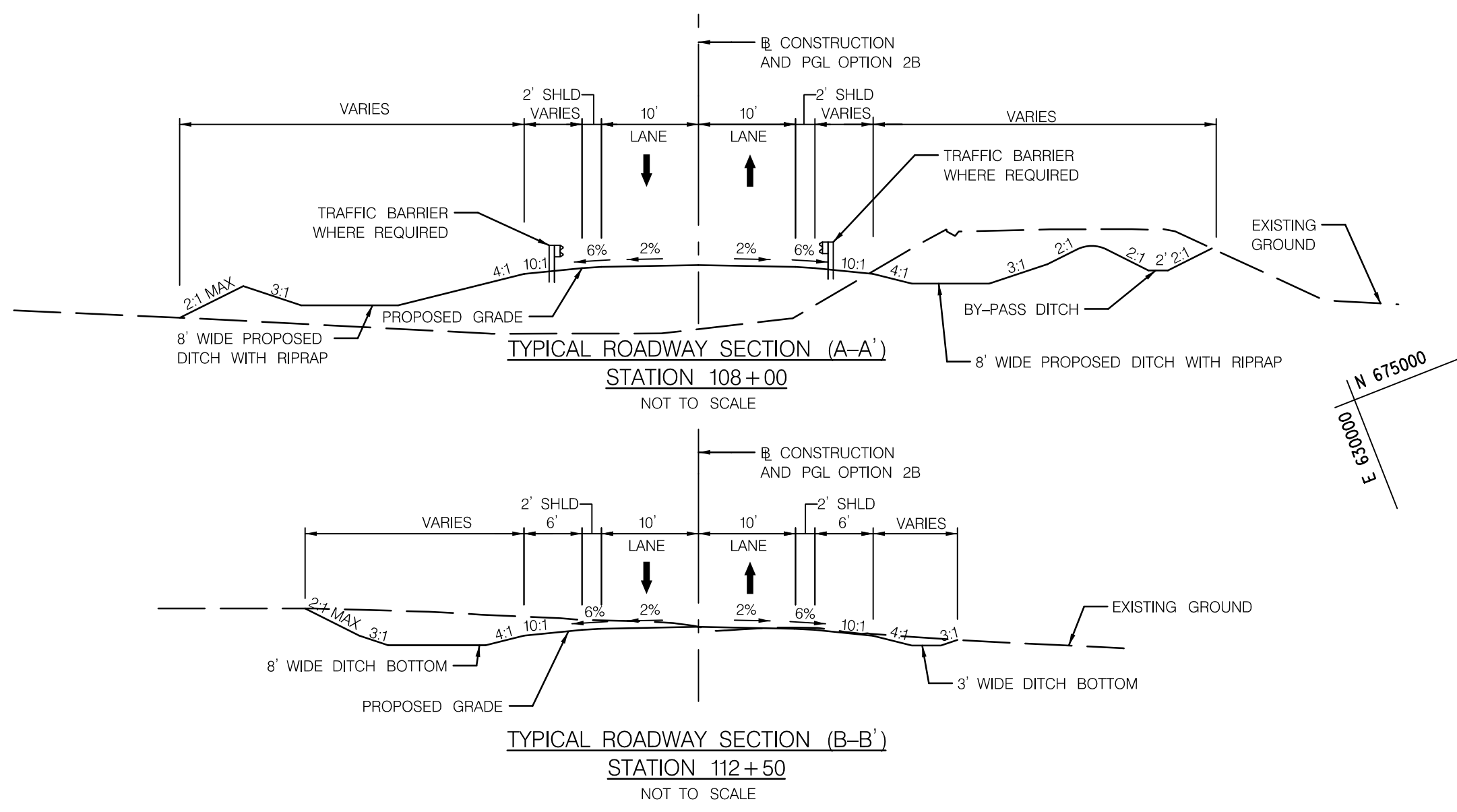
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 OAKLAND, MARYLAND  
 REPLACEMENT OF SWALLOW FALLS ROAD BRIDGE NO. G-0020  
 OVER THE YOUGHIOGHENY RIVER  
 OPTION 2 - PLAN AND SECTIONS

CONT. NO. TBD F.A.P. NO. TBD SHEET NO. X OF 17  
 PREL. TRAC. BY FINAL TRAC. BY

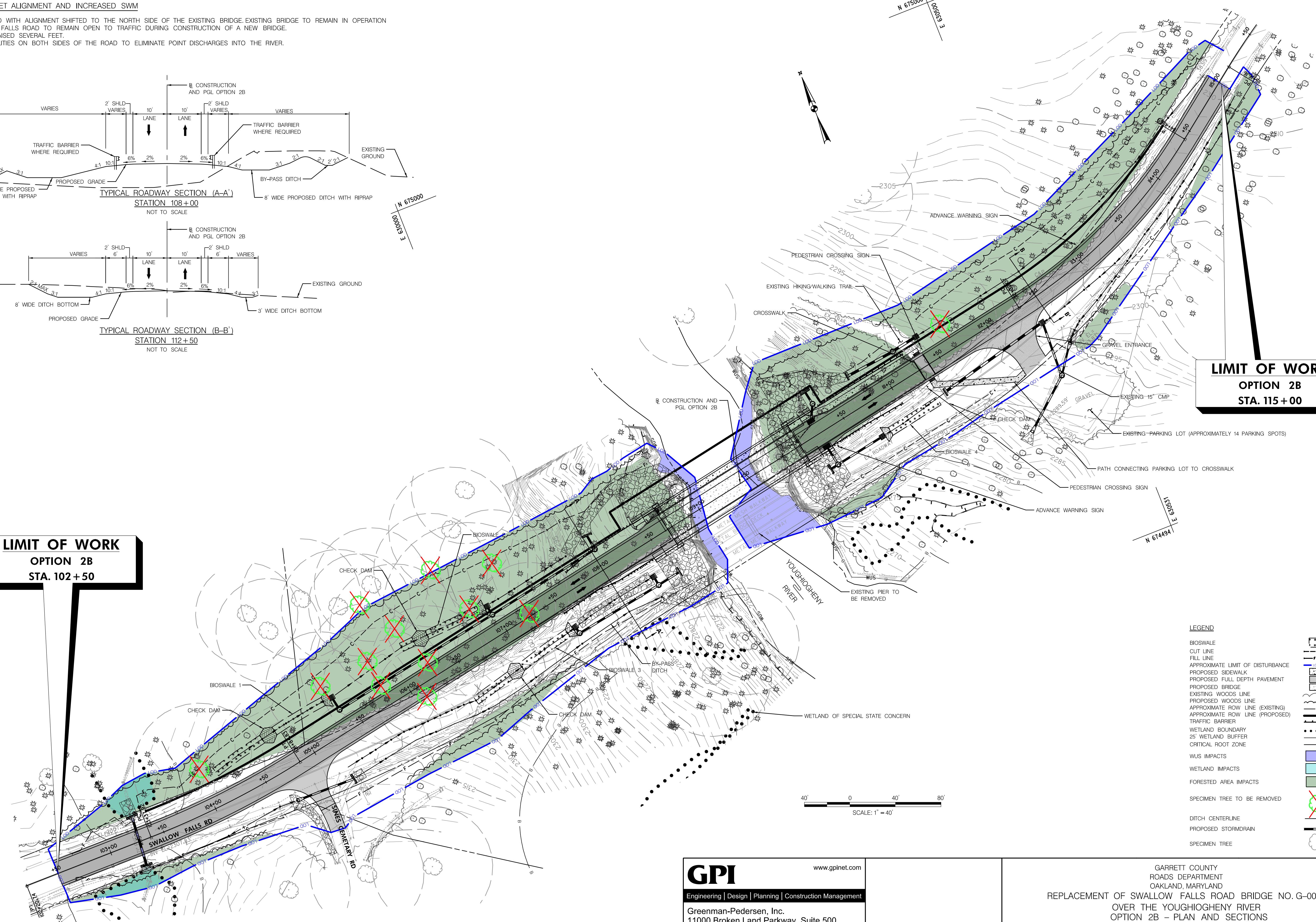
OPTION 2B - OFFSET ALIGNMENT AND INCREASED SWM

- 25 MPH DESIGN SPEED WITH ALIGNMENT SHIFTED TO THE NORTH SIDE OF THE EXISTING BRIDGE. EXISTING BRIDGE TO REMAIN IN OPERATION TO ALLOW SWALLOW FALLS ROAD TO REMAIN OPEN TO TRAFFIC DURING CONSTRUCTION OF A NEW BRIDGE.
- PROPOSED PROFILE RAISED SEVERAL FEET.
- PROPOSED SWM FACILITIES ON BOTH SIDES OF THE ROAD TO ELIMINATE POINT DISCHARGES INTO THE RIVER.



**LIMIT OF WORK**  
OPTION 2B  
STA. 102+50

**LIMIT OF WORK**  
OPTION 2B  
STA. 115+00



**LEGEND**

BIOSWALE	
CUT LINE	
FILL LINE	
APPROXIMATE LIMIT OF DISTURBANCE	
PROPOSED SIDEWALK	
PROPOSED FULL DEPTH PAVEMENT	
PROPOSED BRIDGE	
EXISTING WOODS LINE	
PROPOSED WOODS LINE	
APPROXIMATE ROW LINE (EXISTING)	
APPROXIMATE ROW LINE (PROPOSED)	
TRAFFIC BARRIER	
WETLAND BOUNDARY	
25' WETLAND BUFFER	
CRITICAL ROOT ZONE	
WUS IMPACTS	
WETLAND IMPACTS	
FORESTED AREA IMPACTS	
SPECIMEN TREE TO BE REMOVED	
DITCH CENTERLINE	
PROPOSED STORMDRAIN	
SPECIMEN TREE	

SCALE: 1" = 40'

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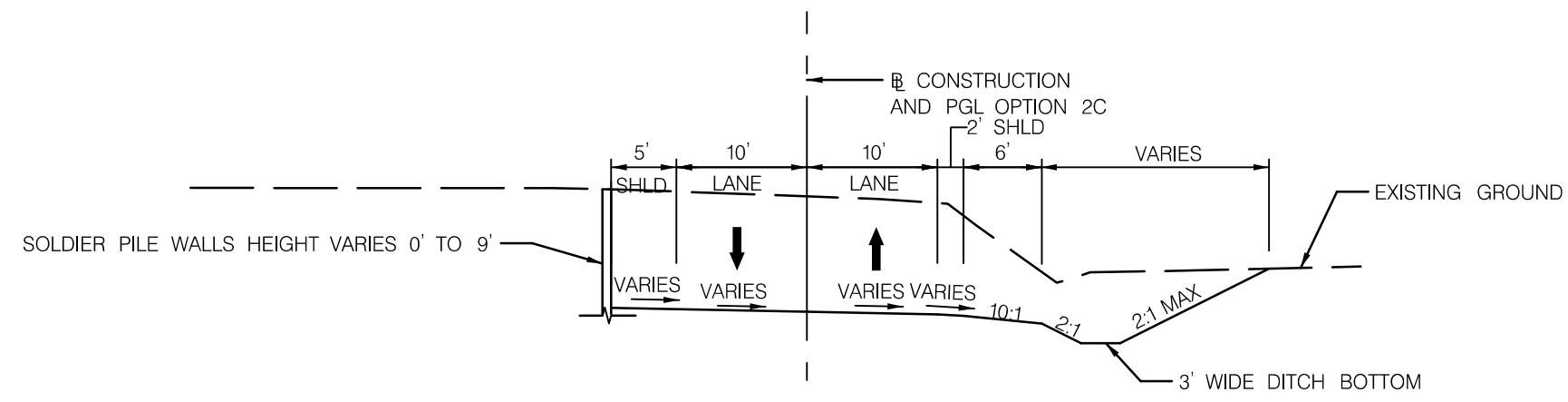
GARRETT COUNTY  
ROADS DEPARTMENT  
OAKLAND, MARYLAND  
REPLACEMENT OF SWALLOW FALLS ROAD BRIDGE NO. G-0020  
OVER THE YOUGHIOGHENY RIVER  
OPTION 2B - PLAN AND SECTIONS

CONT. NO. TBD F.A.P. NO. TBD SHEET NO. X OF 17  
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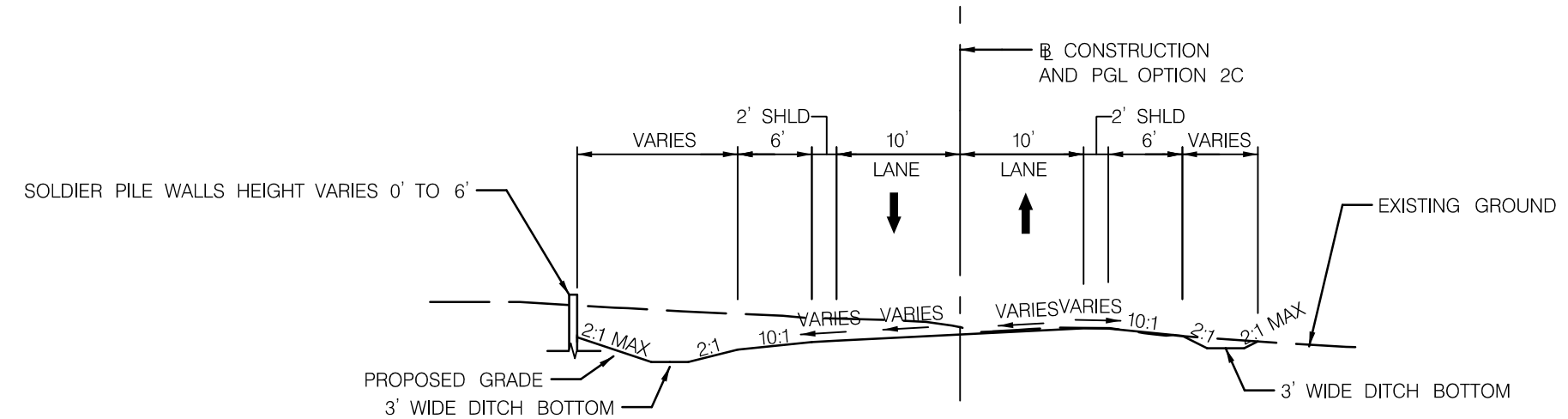
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**OPTION 2C - SHIFT PERMANENT BRIDGE CENTERLINE TO THE NORTH WITH SOLDIER PILE WALLS**

- 25 MPH DESIGN SPEED WITH ALIGNMENT SHIFTED TO THE NORTH SIDE OF THE EXISTING BRIDGE. EXISTING BRIDGE TO REMAIN IN OPERATION TO ALLOW SWALLOW FALLS ROAD TO REMAIN OPEN TO TRAFFIC DURING CONSTRUCTION OF A NEW BRIDGE.
- SOLDIER PILE RETAINING WALLS PROPOSED TO REDUCE GRADING IMPACTS.



**TYPICAL ROADWAY SECTION (A-A')**  
STATION 106+50  
NOT TO SCALE



**TYPICAL ROADWAY SECTION (B-B')**  
STATION 112+50  
NOT TO SCALE

**LIMIT OF WORK**  
OPTION 2C  
STA. 102+50

**LIMIT OF WORK**  
OPTION 2C  
STA. 115+00



**LEGEND**

CUT LINE	
FILL LINE	
APPROXIMATE LIMIT OF DISTURBANCE	
PROPOSED SIDEWALK	
PROPOSED FULL DEPTH PAVEMENT	
PROPOSED BRIDGE	
EXISTING WOODS LINE	
PROPOSED WOODS LINE	
APPROXIMATE ROW LINE (EXISTING)	
APPROXIMATE ROW LINE (PROPOSED)	
TRAFFIC BARRIER	
WETLAND BOUNDARY	
25' WETLAND BUFFER	
CRITICAL ROOT ZONE	
WUS IMPACTS	
WETLAND IMPACTS	
FORESTED AREA IMPACTS	
SPECIMEN TREE TO BE REMOVED	
DITCH CENTERLINE	
SPECIMEN TREE	

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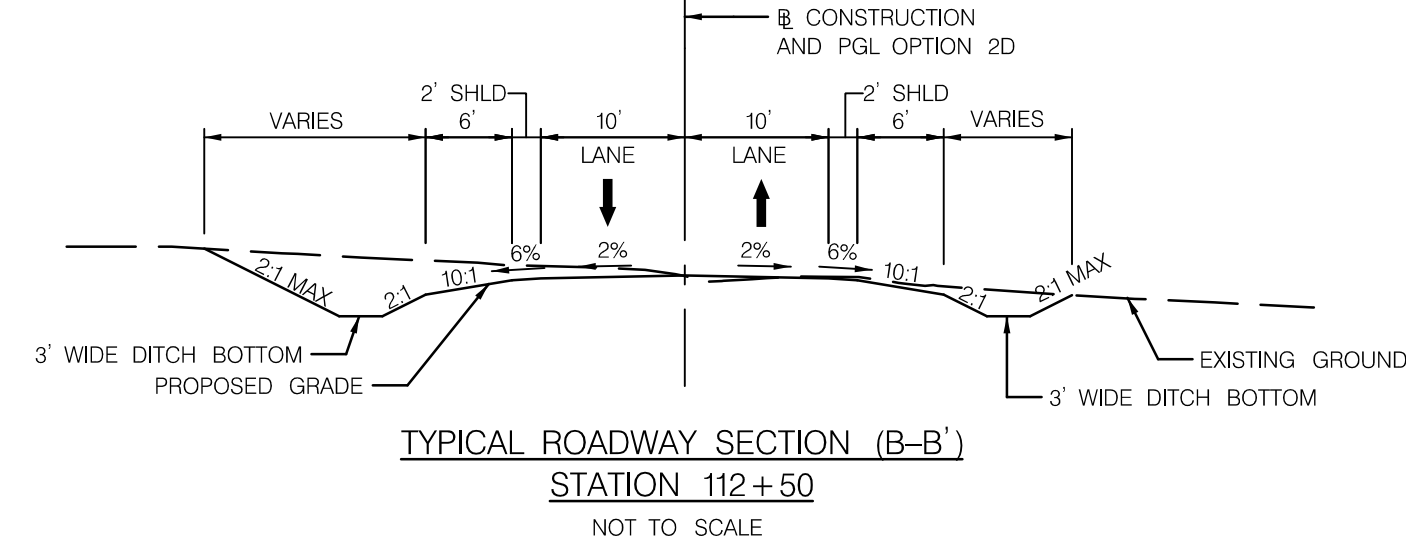
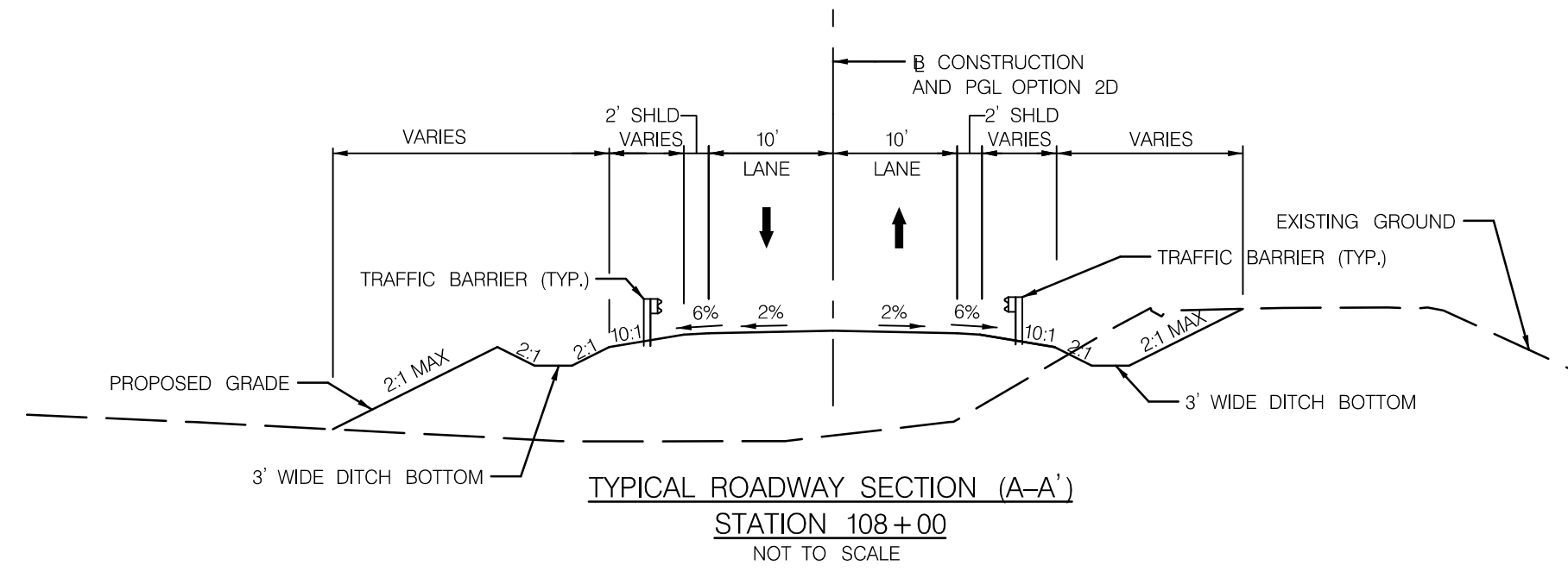
GARRETT COUNTY  
 ROADS DEPARTMENT  
 OAKLAND, MARYLAND  
**REPLACEMENT OF SWALLOW FALLS ROAD BRIDGE NO. G-0020  
 OVER THE YOUGHIOGHENY RIVER  
 OPTION 2C - PLAN AND SECTIONS**

CONT. NO. TBD F.A.P. NO. TBD SHEET NO. X OF 17  
 PREL. TRAC. BY FINAL TRAC. BY

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 PLOT SCALE: 1/4"=1'-0"  
 PLOT DATE: 6/20/2023 10:58:15 AM  
 PLOT BY: J. G. [unreadable]  
 PROJECT: GARRETT COUNTY ROADS DEPARTMENT  
 DRAWING: REPLACEMENT OF SWALLOW FALLS ROAD BRIDGE NO. G-0020 OVER THE YOUGHIOGHENY RIVER  
 SHEET: OPTION 2C - PLAN AND SECTIONS  
 SHEET NO. X OF 17

OPTION 2D - SHIFT PERMANENT BRIDGE CENTERLINE TO THE NORTH WITH DITCHES

· 25 MPH DESIGN SPEED WITH ALIGNMENT SHIFTED TO THE NORTH SIDE OF THE EXISTING BRIDGE. EXISTING BRIDGE TO REMAIN IN OPERATION TO ALLOW SWALLOW FALLS ROAD TO REMAIN OPEN TO TRAFFIC DURING CONSTRUCTION OF A NEW BRIDGE.  
 · ROADSIDE DITCHES PROPOSED TO CONVEY RUNOFF, NO SOLDIER PILE RETAINING WALLS.



**LIMIT OF WORK**  
**OPTION 2D**  
**STA. 102+50**

**LIMIT OF WORK**  
**OPTION 2D**  
**STA. 115+00**



**LEGEND**

CUT LINE	
FILL LINE	
APPROXIMATE LIMIT OF DISTURBANCE	
PROPOSED SIDEWALK	
PROPOSED FULL DEPTH PAVEMENT	
PROPOSED BRIDGE	
EXISTING WOODS LINE	
PROPOSED WOODS LINE	
APPROXIMATE ROW LINE (EXISTING)	
APPROXIMATE ROW LINE (PROPOSED)	
TRAFFIC BARRIER	
WETLAND BOUNDARY	
25' WETLAND BUFFER	
CRITICAL ROOT ZONE	
WUS IMPACTS	
WETLAND IMPACTS	
FORESTED AREA IMPACTS	
SPECIMEN TREE TO BE REMOVED	
DITCH CENTERLINE	
SPECIMEN TREE	
PROPOSED SIGN	

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 OAKLAND, MARYLAND  
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 OVER THE YOUGHIOGHENY RIVER  
 OPTION 2D - PLAN AND SECTIONS

CONT. NO. TBD F.A.P. NO. TBD SHEET NO. X OF 17  
 PREL. TRAC. BY FINAL TRAC. BY

PLOTTED: 6/20/2023  
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## **Appendix G – Option 2C and 2D Renderings**

**Existing Conditions Photographs**

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**Existing Conditions of the eastern approach to the Swallow Falls Road Bridge.**



**Existing Conditions of the western approach to the Swallow Falls Road Bridge.**



**Renderings for Option 2C – Construct Bridge on Offset Alignment using Soldier Pile Retaining Walls**



**Option 2C proposed post construction conditions of the eastern approach to the Swallow Falls Road Bridge.**



**Option 2C proposed post construction condition of the western approach to the Swallow Falls Road Bridge.**



**Option 2C proposed post construction condition of the Swallow Falls Bridge.**

**Renderings for Option 2D – Construction Bridge on Offset Alignment using Raised Profile**



**Option 2D proposed post construction conditions of the eastern approach to the Swallow Falls Road Bridge.**



**Option 2D proposed post construction conditions of the western approach to the Swallow Falls Bridge.**



Option 2D proposed post construction condition of the Swallow Falls Bridge.

## **Appendix H – PENELEC Letter and Plat**

P E N N S Y L V A N I A  
E L E C T R I C      P E N E L E C      C O M P A N Y

Johnstown, Pennsylvania  
August 9, 1954

County Commissioners of Garrett County  
Oakland, Maryland

Gentlemen:

Pennsylvania Electric Company hereby gives permission to the County Commissioners of Garrett County, Maryland, to use certain land upon which it is proposed to relocate Garrett County Route No. 20 and the Swallow Falls Bridge.

The strip of land has been surveyed by F. R. Corliss under date of August 2, 1954, and is described as follows, to wit:

"For the center-line of a strip of land fifty feet in width with an additional width, if necessary, for side slopes of cuts and fills, and upon which it is proposed to re-locate Garrett County Route No. 20 and the Swallow Falls Bridge; the said strip of land being located on the 97.49-acre tract that was conveyed by the Grand Lodge of A. F. and A. M. of Pennsylvania and The Grand Lodge of A. F. and A. M. of West Virginia to Youghioghenny Hydro-Electric Corporation by an Inquisition dated June 30, 1926, and recorded in Liber 93, folio 226, one of the Land Records of Garrett County, Maryland.

The center-line of said right of way or road easement hereby intended to be granted is more particularly described as follows:

Beginning at a point in the present road at Station 2 + 64.45; said point being South 48 degrees 40 minutes East 34.2 feet from a concrete monument marked, "N-876"; said monument being the fifth corner of said 97.49-acre tract, and running thence from said beginning point with a ten degree curve to the left to Station 3 + 63.28; thence a tangent crossing the Youghioghenny River and passing the southwest corner of the present bridge to the southeast by a distance of 38.3 feet at Station 5 + 61 and passing the southeast corner of the present bridge to the southeast by a distance of 25.0 feet at Station 6 + 61, to Station 8 + 62.6; thence with a sixteen degree curve to the left to Station 10 + 33.75 in the center of the present road, a total length of 769.3 feet. Plat showing the location is attached."

The privilege to use a strip of land for the purposes aforesaid is with the full understanding that it will in no manner affect any of the riparian rights of the Company.

Very truly yours



W. C. SONTUM  
Vice President

dt



50000

110000

50000

The Grand Lodge of A.F. No. A.M. of Penna.  
The Grand Lodge of A.F. No. A.M. of W. Va.

Eastern Land Corporation  
97.49 Acres

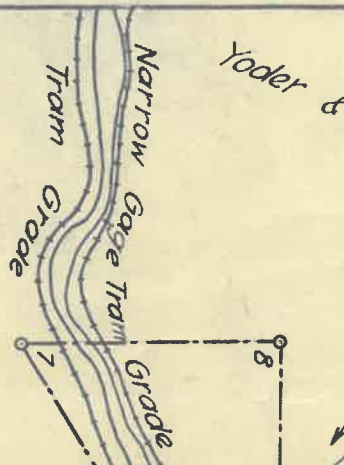
*97.49*

Yoder & Vandersaal

DEEP CREEK  
Newron A. Reams

Daisy C. Reams

Yoder & Vandersaal  
ALICE SINES  
RIVER



Muddy Cr.

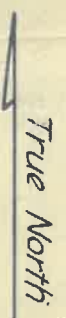


The Grand Lodge of A.F. No. A.M. of Penna.  
The Grand Lodge of A.F. No. A.M. of W. Va.

1-2	S	2-57	W	696.7
2-3	South			486.0
3-4	N	60-29	W	512.9
4-5	N	48-40	W	<b>890.0</b>
5-6	N	13-36	E	3565.2
6-7	N	31-49	W	1966.4
7-8	N	89-38	E	1327.3
8-9	South			4573.1
9-10	S	47-42	W	33.0
10-1	S	1-51	E	208.2

110000

45000



YOUGHIOGHENY RIVER  
HYDRO-ELECTRIC PROJECT

PLAN OF PROPERTY NO. 14-9

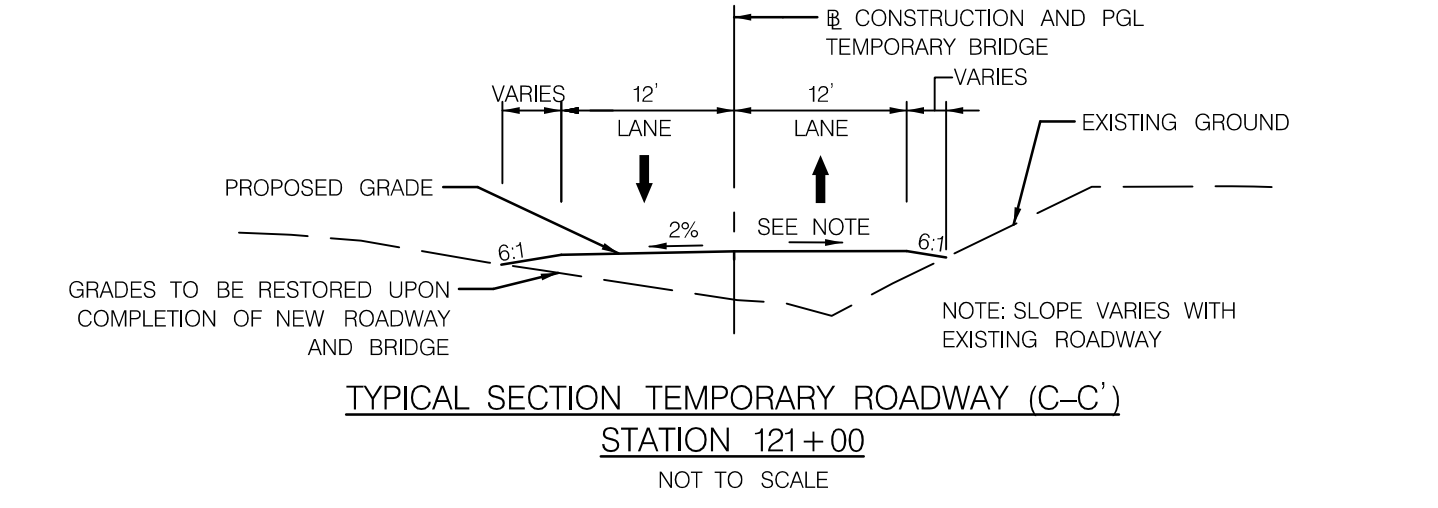
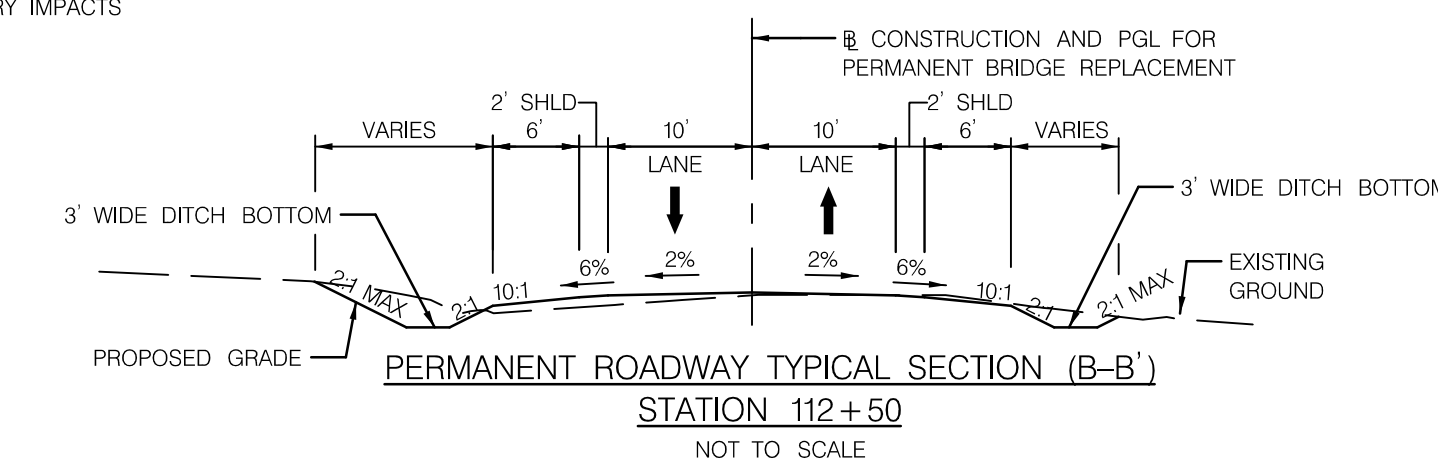
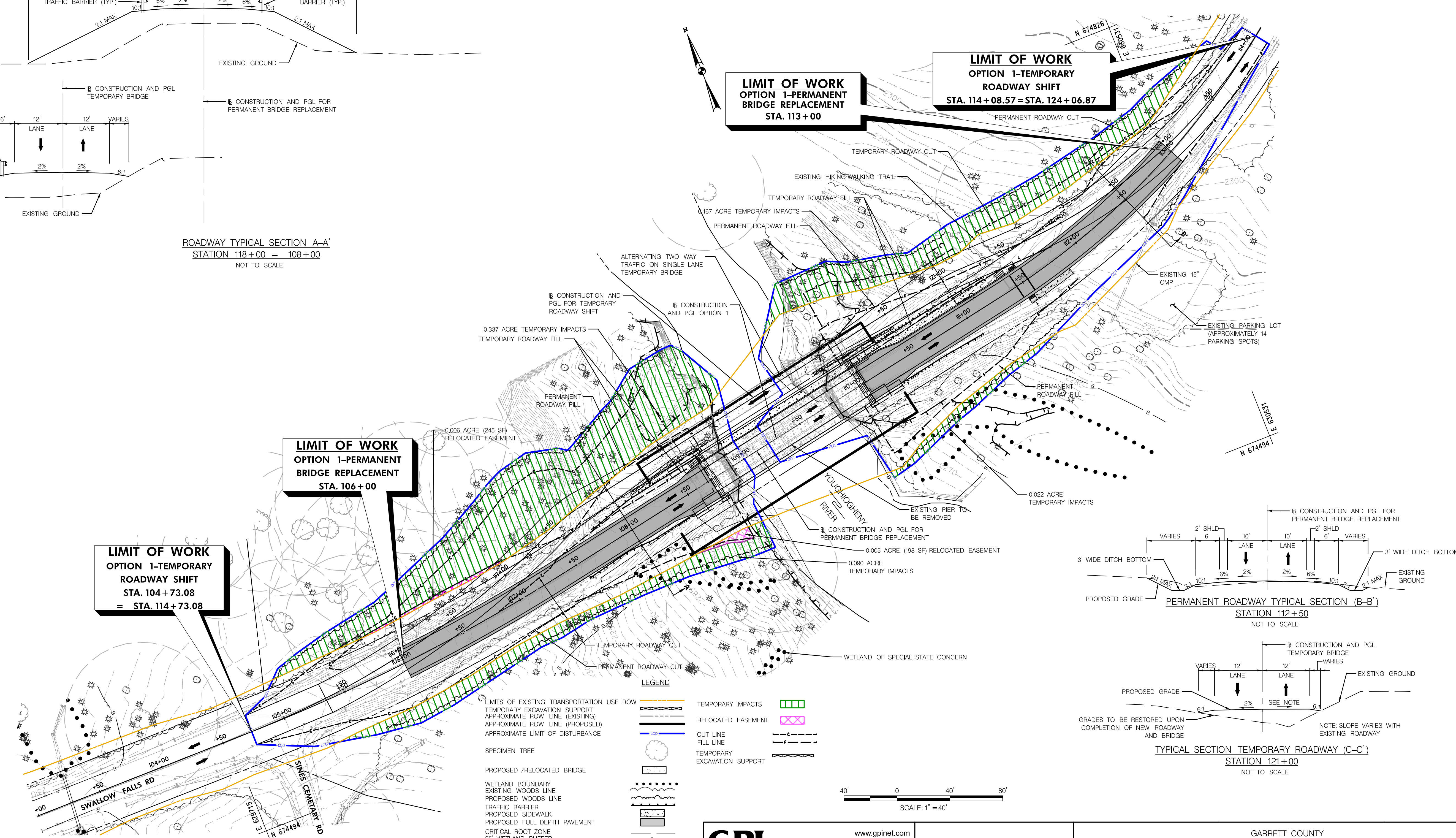
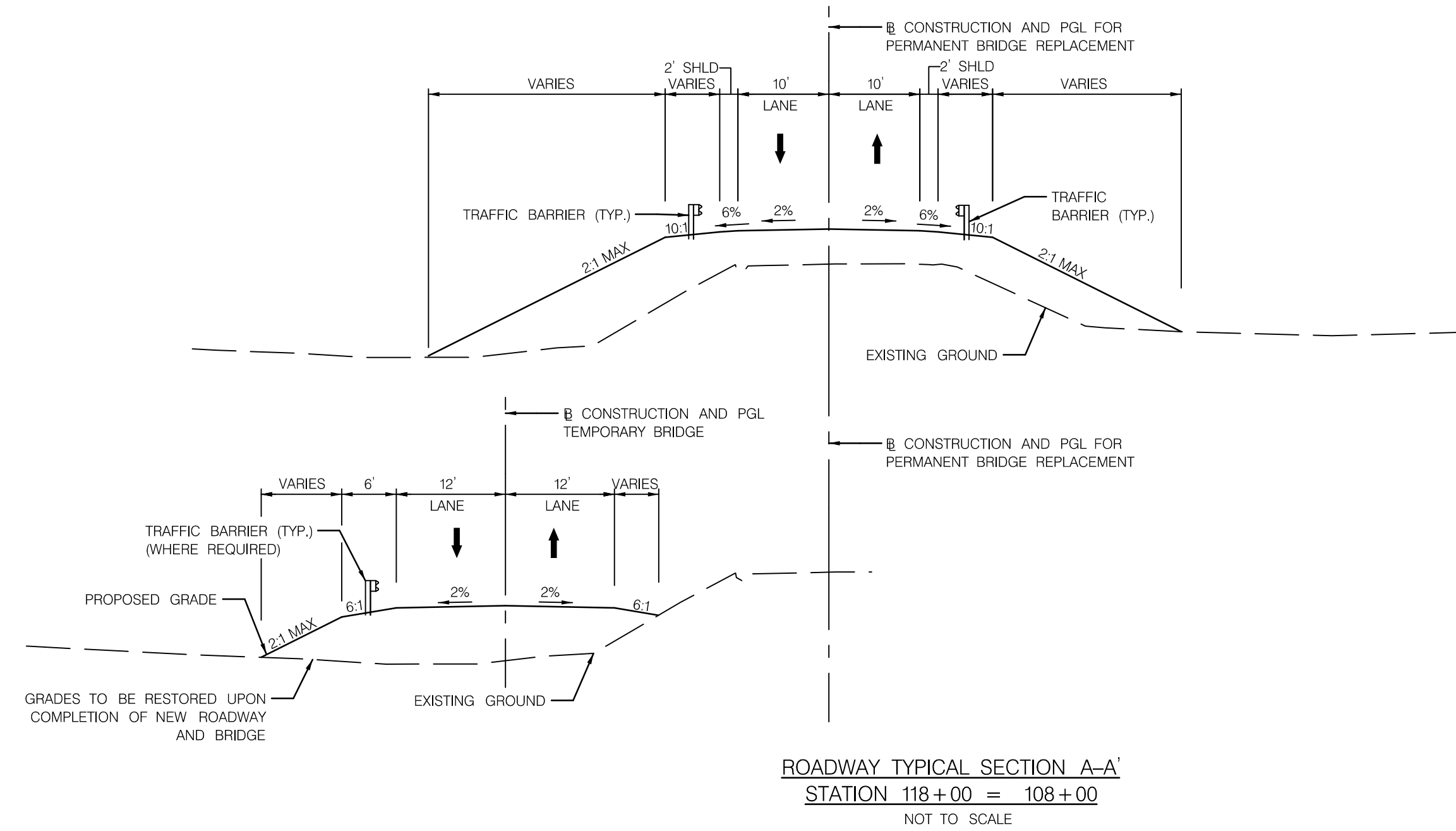
COUNTY Garrett  
DISTRICT West Oakland

Drawn by C.M.M. Checked by F.R.C.  
Scale 1" = 1000' Date 11-26-23

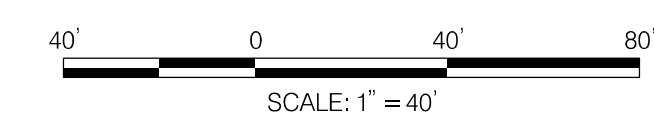
## **Appendix I - Parkland Impact Exhibits**

OPTION 1 - MAINTAIN EXISTING PERMANENT BRIDGE CENTERLINE WITH TEMPORARY ROADWAY AND BRIDGE TO THE NORTH

25 MPH DESIGN SPEED ROADWAY ALIGNMENT TO MATCH EXISTING CENTER LINE OF SWALLOW FALLS ROAD.  
 EXISTING SINGLE SPAN ACROW PANEL TRUSS STRUCTURE TO BE RELOCATED TO THE NORTH SIDE OF THE  
 EXISTING BRIDGE USING A TEMPORARY ROADWAY SHIFT BASED ON A 15 MPH DESIGN SPEED TO ALLOW  
 SWALLOW FALLS ROAD TO REMAIN OPEN TO TRAFFIC DURING CONSTRUCTION OF A NEW BRIDGE.



- LEGEND**
- LIMITS OF EXISTING TRANSPORTATION USE ROW
  - TEMPORARY EXCAVATION SUPPORT
  - APPROXIMATE ROW LINE (EXISTING)
  - APPROXIMATE ROW LINE (PROPOSED)
  - APPROXIMATE LIMIT OF DISTURBANCE
  - SPECIMEN TREE
  - PROPOSED /RELOCATED BRIDGE
  - WETLAND BOUNDARY
  - EXISTING WOODS LINE
  - PROPOSED WOODS LINE
  - TRAFFIC BARRIER
  - PROPOSED SIDEWALK
  - PROPOSED FULL DEPTH PAVEMENT
  - CRITICAL ROOT ZONE
  - 25' WETLAND BUFFER
  - TEMPORARY IMPACTS
  - RELOCATED EASEMENT
  - CUT LINE
  - FILL LINE
  - TEMPORARY EXCAVATION SUPPORT



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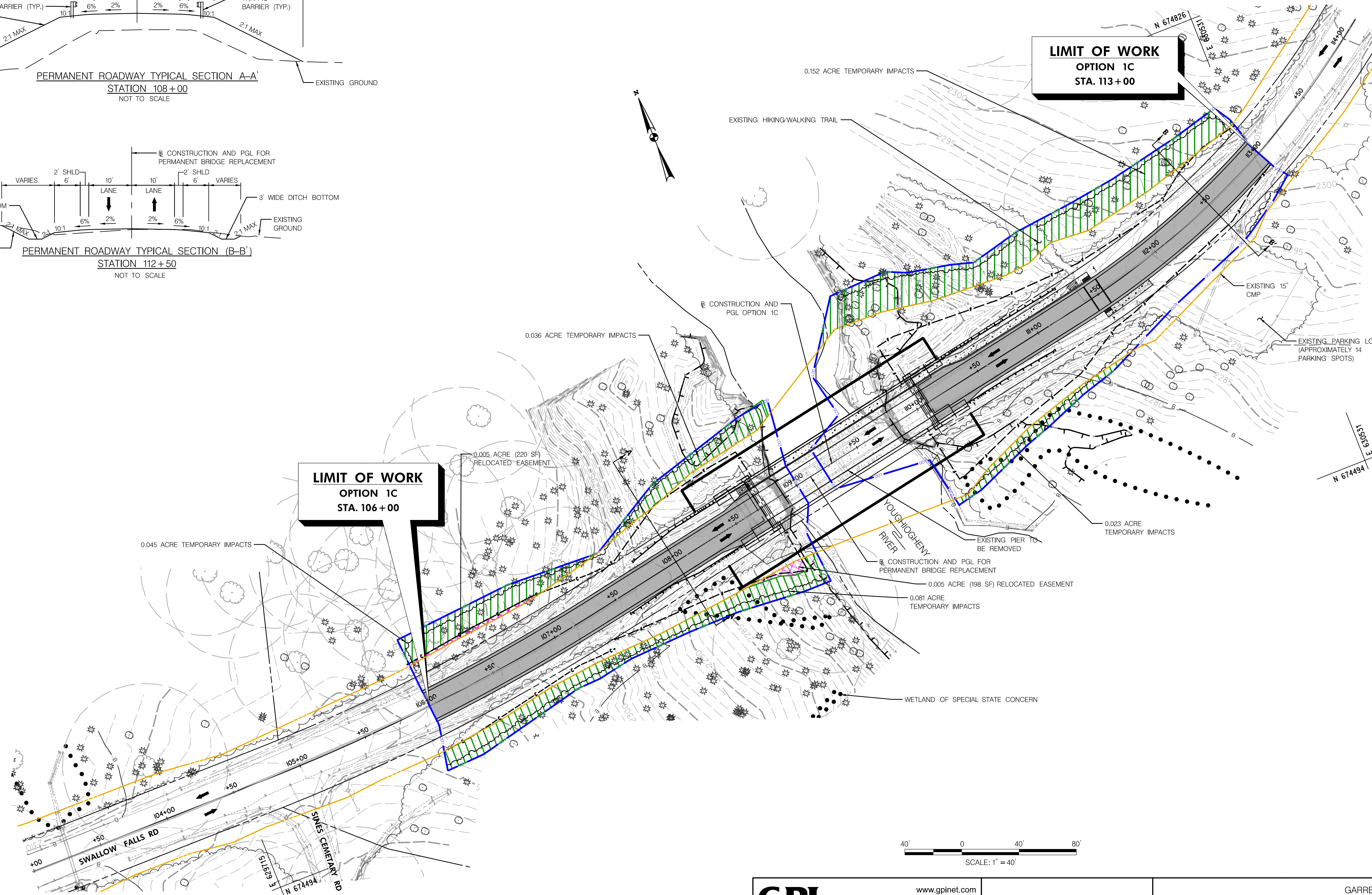
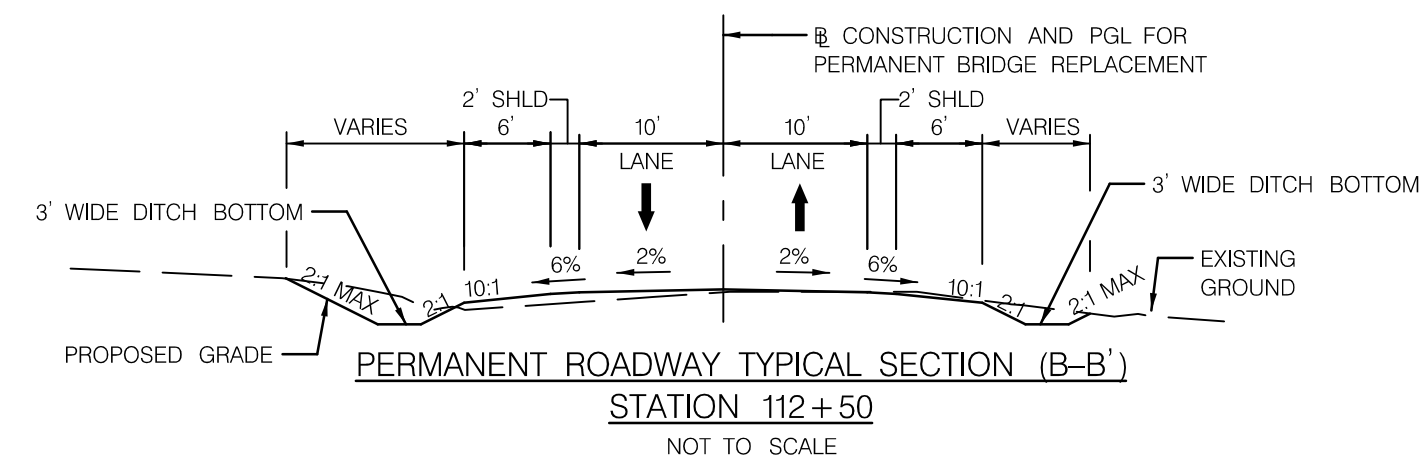
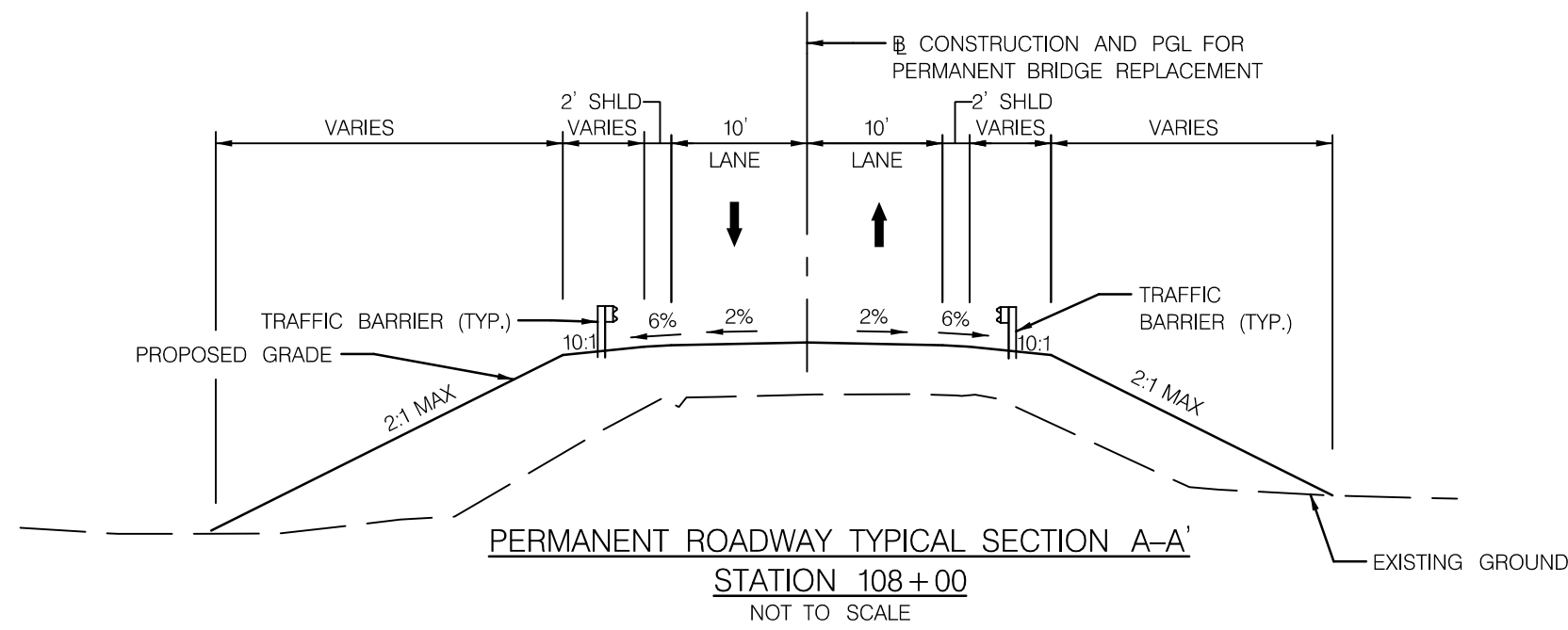
GARRETT COUNTY  
 ROADS DEPARTMENT  
 OAKLAND, MARYLAND  
 REPLACEMENT OF SWALLOW FALLS ROAD BRIDGE NO. G-0020  
 OVER THE YOUGHIOGHENY RIVER  
 OPTION 1 - PLAN AND SECTIONS PARKLAND IMPACTS

CONT. NO. TBD F.A.P. NO. TBD SHEET NO. X OF 17  
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PLOTTED: 6/20/2023  
 FILE: N:\2023\20230601\_2023\_SNA\_Schedule\Bldg\_Design\_Schedule\Task\_25\_Swallow\_Falls\_Rd\Bldg\CAD\Working\Option\_1\_Plan\_Impacts\Option\_1\_Schedule\_Land\_Impacts.dwg

OPTION 1C - MAINTAIN EXISTING PERMANENT BRIDGE CENTERLINE NO TEMPORARY ROADWAY AND BRIDGE TO THE NORTH

- 25 MPH DESIGN SPEED ROADWAY ALIGNMENT TO MATCH EXISTING CENTER LINE OF SWALLOW FALLS ROAD.
- SWALLOW FALLS ROAD WOULD BE CLOSED AND TRAFFIC DETOURED DURING CONSTRUCTION OF NEW BRIDGE.



**LEGEND**

APPROXIMATE ROW LINE (PROPOSED)	
CUT LINE	
FILL LINE	
APPROXIMATE LIMIT OF DISTURBANCE	
PROPOSED SIDEWALK	
PROPOSED FULL DEPTH PAVEMENT	
PROPOSED BRIDGE	
EXISTING WOODS LINE	
PROPOSED WOODS LINE	
APPROXIMATE ROW LINE (EXISTING)	
TRAFFIC BARRIER	
WETLAND BOUNDARY	
25' WETLAND BUFFER	
CRITICAL ROOT ZONE	
DITCH CENTERLINE	
PROPOSED STORMDRAIN	
SPECIMEN TREE	
TEMPORARY IMPACTS	
RELOCATED EASEMENT	
VACATED EASEMENT	
LIMITS OF EXISTING TRANSPORTATION USE ROW	

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GARRETT COUNTY  
ROADS DEPARTMENT  
OAKLAND, MARYLAND

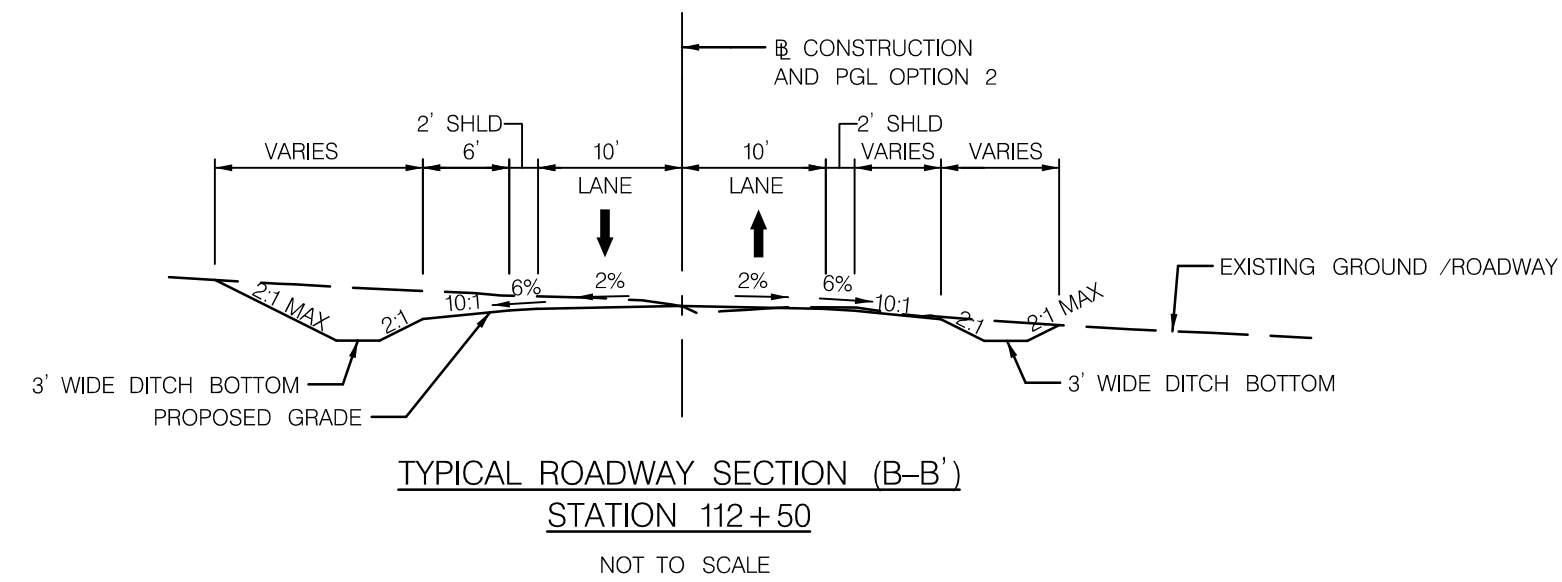
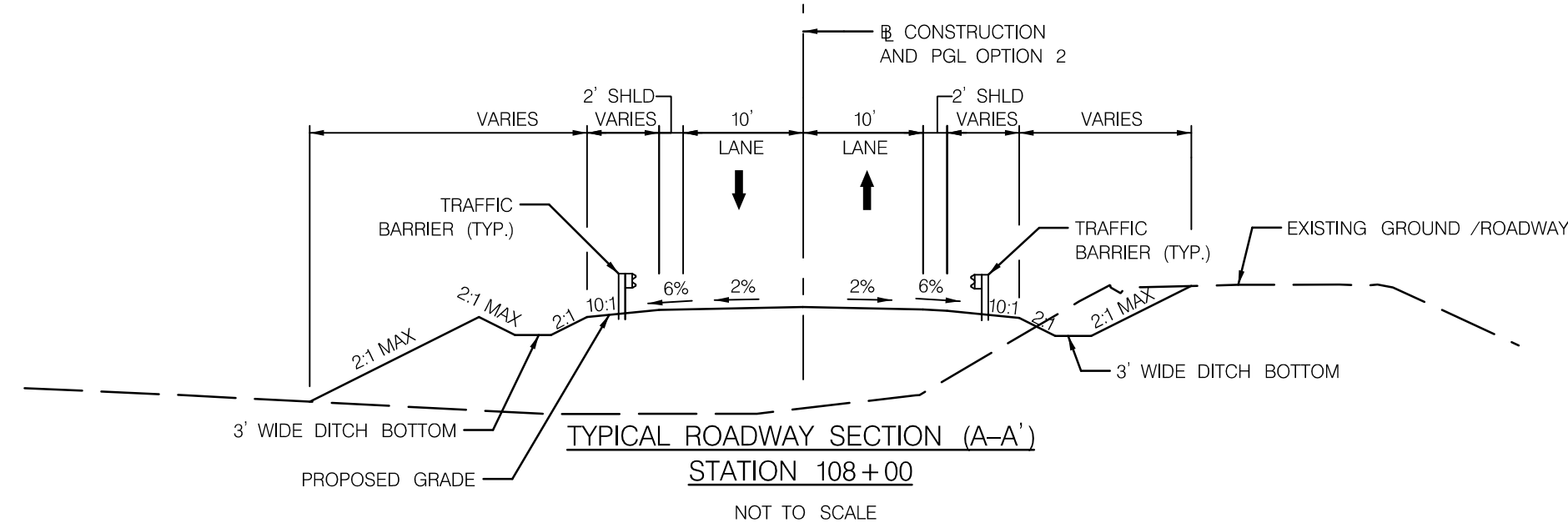
REPLACEMENT OF SWALLOW FALLS ROAD BRIDGE NO. G-0020  
OVER THE YOUGHIOGHENY RIVER  
OPTION 1C - PLAN AND SECTIONS PARKLAND IMPACTS

CONT. NO. TBD F.A.P. NO. TBD SHEET NO. X OF 17  
PREL. TRAC. BY FINAL TRAC. BY

PLOTTED: 6/16/2023  
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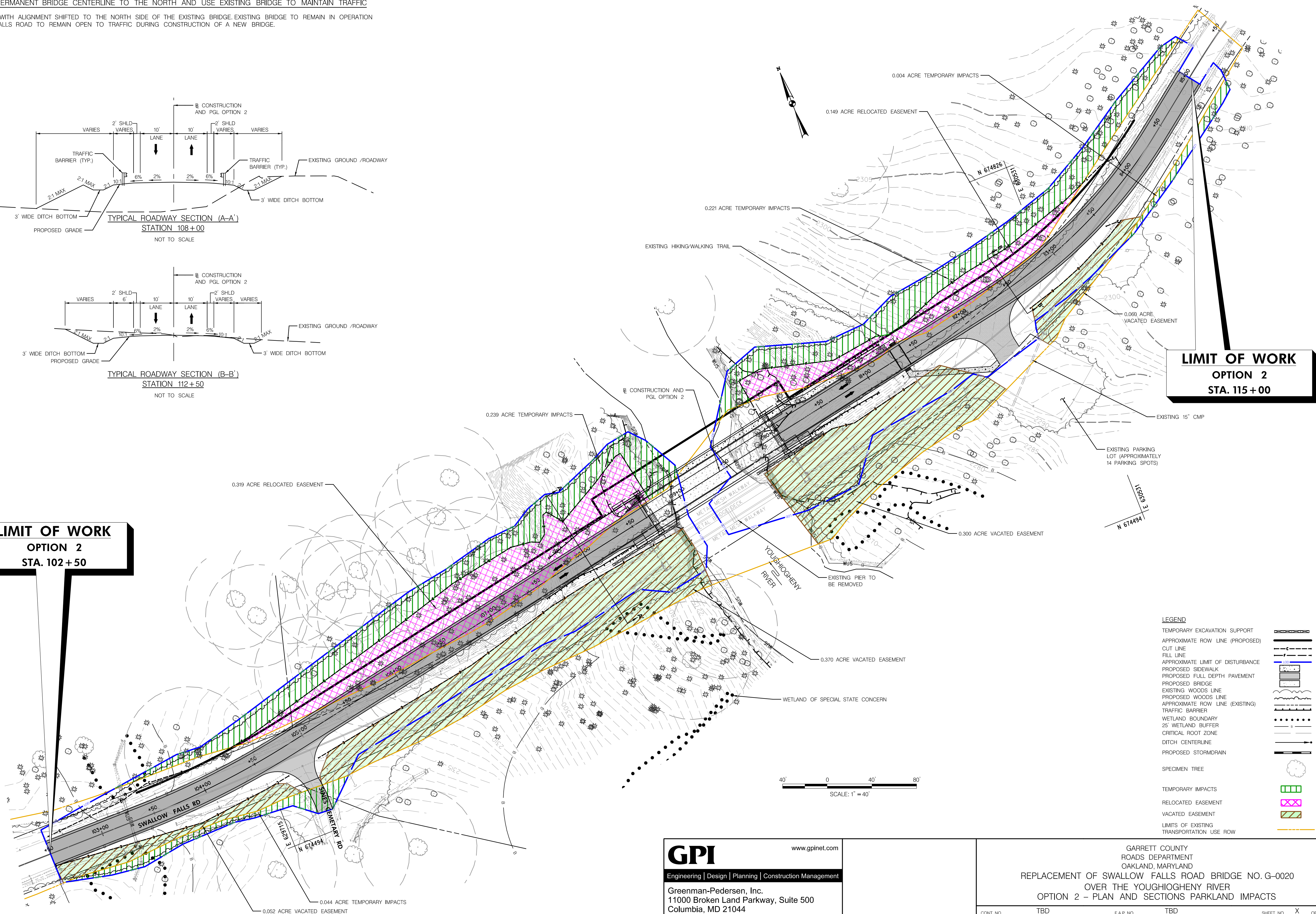
OPTION 2 - SHIFT PERMANENT BRIDGE CENTERLINE TO THE NORTH AND USE EXISTING BRIDGE TO MAINTAIN TRAFFIC

25 MPH DESIGN SPEED WITH ALIGNMENT SHIFTED TO THE NORTH SIDE OF THE EXISTING BRIDGE. EXISTING BRIDGE TO REMAIN IN OPERATION TO ALLOW SWALLOW FALLS ROAD TO REMAIN OPEN TO TRAFFIC DURING CONSTRUCTION OF A NEW BRIDGE.



**LIMIT OF WORK**  
OPTION 2  
STA. 102+50

**LIMIT OF WORK**  
OPTION 2  
STA. 115+00



**LEGEND**

TEMPORARY EXCAVATION SUPPORT	
APPROXIMATE ROW LINE (PROPOSED)	
CUT LINE	
FILL LINE	
APPROXIMATE LIMIT OF DISTURBANCE	
PROPOSED SIDEWALK	
PROPOSED FULL DEPTH PAVEMENT	
PROPOSED BRIDGE	
EXISTING WOODS LINE	
PROPOSED WOODS LINE	
APPROXIMATE ROW LINE (EXISTING)	
TRAFFIC BARRIER	
WETLAND BOUNDARY	
25' WETLAND BUFFER	
CRITICAL ROOT ZONE	
DITCH CENTERLINE	
PROPOSED STORMDRAIN	
SPECIMEN TREE	
TEMPORARY IMPACTS	
RELOCATED EASEMENT	
VACATED EASEMENT	
LIMITS OF EXISTING TRANSPORTATION USE ROW	

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GARRETT COUNTY  
ROADS DEPARTMENT  
OAKLAND, MARYLAND  
REPLACEMENT OF SWALLOW FALLS ROAD BRIDGE NO. G-0020  
OVER THE YOUGHIOGHENY RIVER  
OPTION 2 - PLAN AND SECTIONS PARKLAND IMPACTS

CONT. NO. TBD F.A.P. NO. TBD SHEET NO. X OF 17  
PREL. TRAC. BY FINAL TRAC. BY

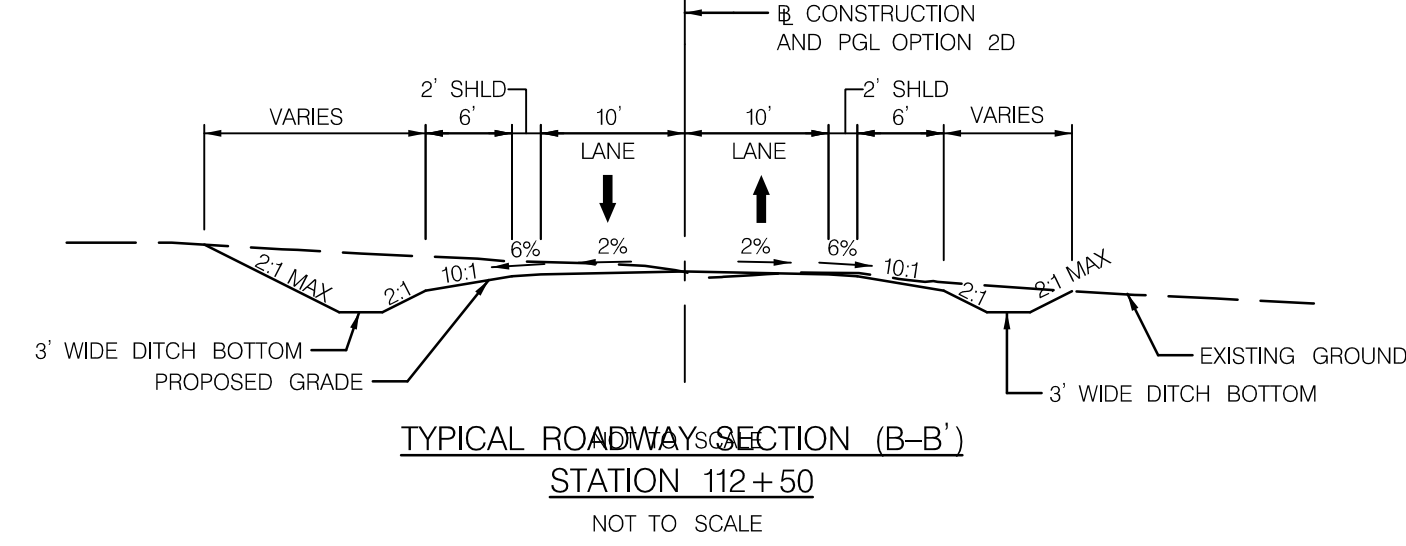
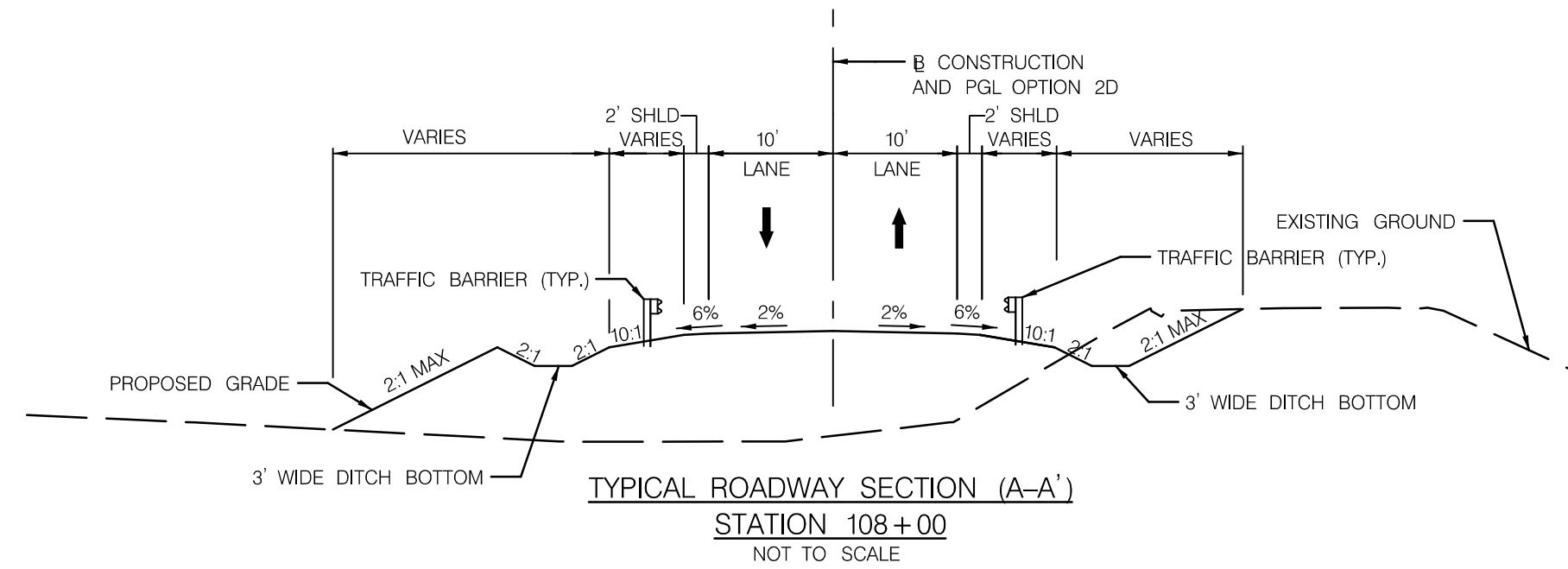
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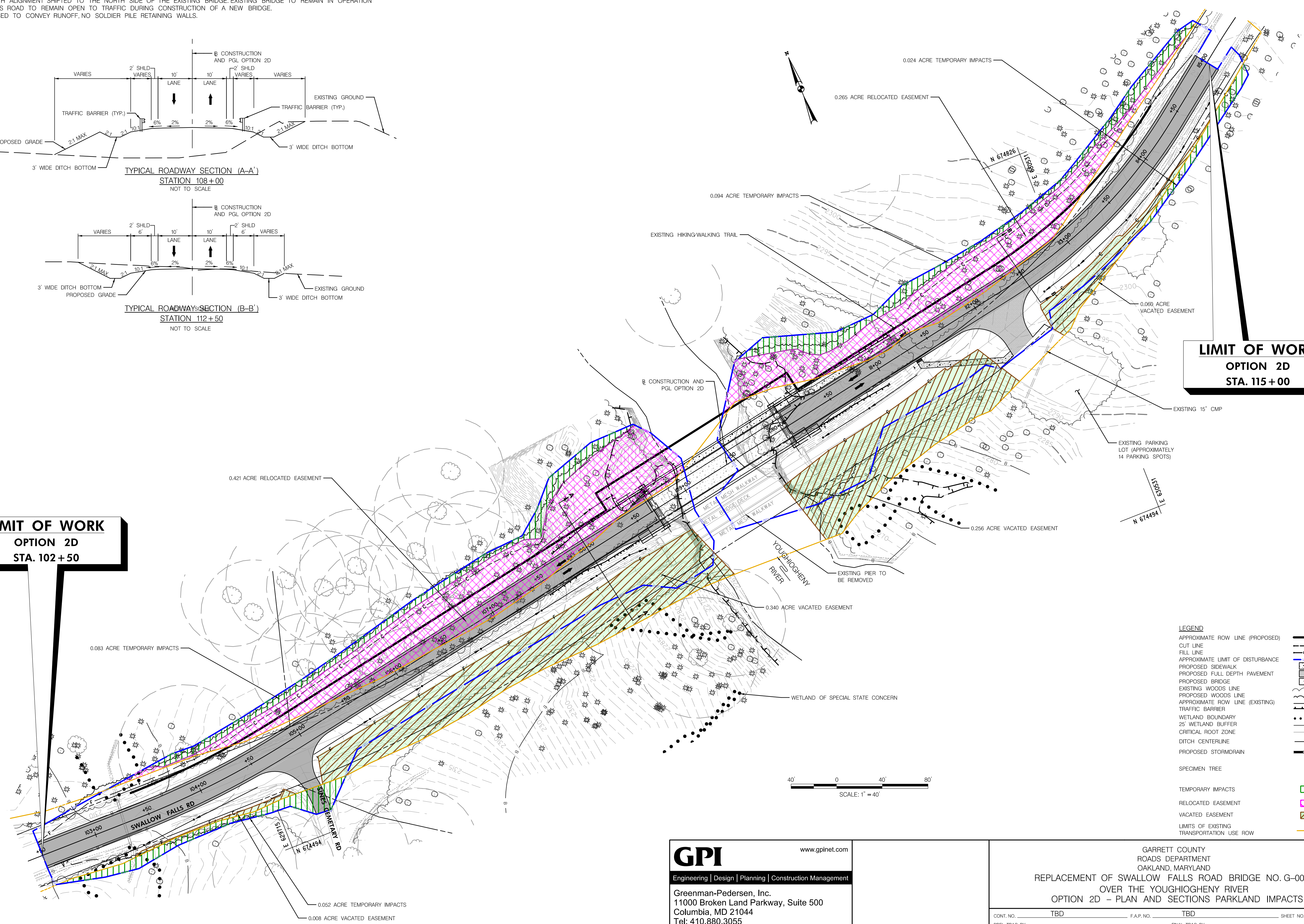
OPTION 2D - SHIFT PERMANENT BRIDGE CENTERLINE TO THE NORTH WITH DITCHES

· 25 MPH DESIGN SPEED WITH ALIGNMENT SHIFTED TO THE NORTH SIDE OF THE EXISTING BRIDGE. EXISTING BRIDGE TO REMAIN IN OPERATION TO ALLOW SWALLOW FALLS ROAD TO REMAIN OPEN TO TRAFFIC DURING CONSTRUCTION OF A NEW BRIDGE.  
 · ROADSIDE DITCHES PROPOSED TO CONVEY RUNOFF, NO SOLDIER PILE RETAINING WALLS.



**LIMIT OF WORK**  
 OPTION 2D  
 STA. 102+50

**LIMIT OF WORK**  
 OPTION 2D  
 STA. 115+00



**LEGEND**

APPROXIMATE ROW LINE (PROPOSED)	
CUT LINE	
FILL LINE	
APPROXIMATE LIMIT OF DISTURBANCE	
PROPOSED SIDEWALK	
PROPOSED FULL DEPTH PAVEMENT	
PROPOSED BRIDGE	
EXISTING WOODS LINE	
PROPOSED WOODS LINE	
APPROXIMATE ROW LINE (EXISTING)	
TRAFFIC BARRIER	
WETLAND BOUNDARY	
25' WETLAND BUFFER	
CRITICAL ROOT ZONE	
DITCH CENTERLINE	
PROPOSED STORMDRAIN	
SPECIMEN TREE	
TEMPORARY IMPACTS	
RELOCATED EASEMENT	
VACATED EASEMENT	
LIMITS OF EXISTING TRANSPORTATION USE ROW	

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 OAKLAND, MARYLAND  
 REPLACEMENT OF SWALLOW FALLS ROAD BRIDGE NO. G-0020  
 OVER THE YOUGHIOGHENY RIVER  
 OPTION 2D - PLAN AND SECTIONS PARKLAND IMPACTS

CONT. NO. TBD F.A.P. NO. TBD SHEET NO. X OF 17  
 PREL. TRAC. BY FINAL TRAC. BY

PLOTTED: 6/20/2023  
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 PLOTTER: HP DesignJet 5000 Series Plotter